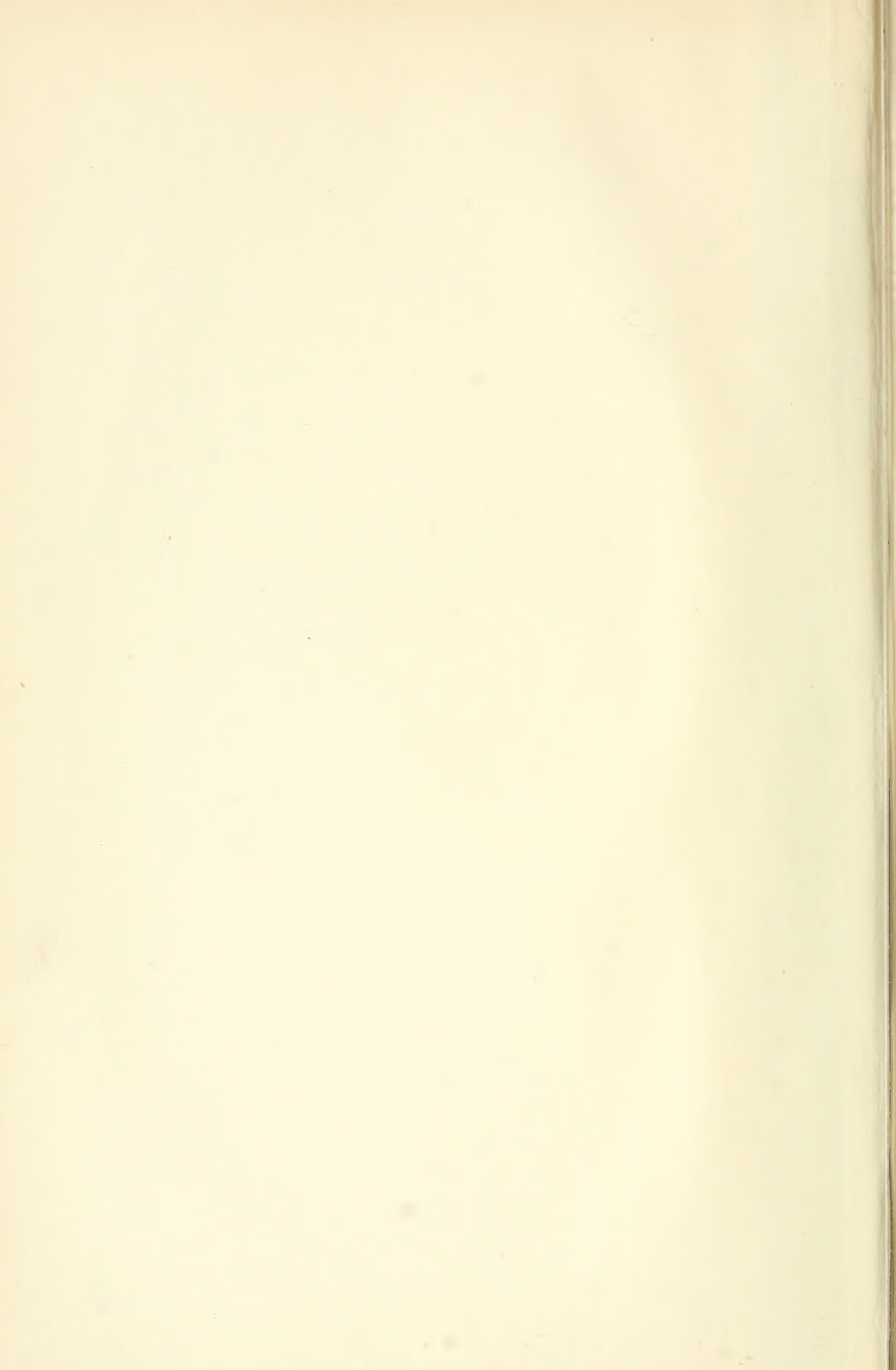
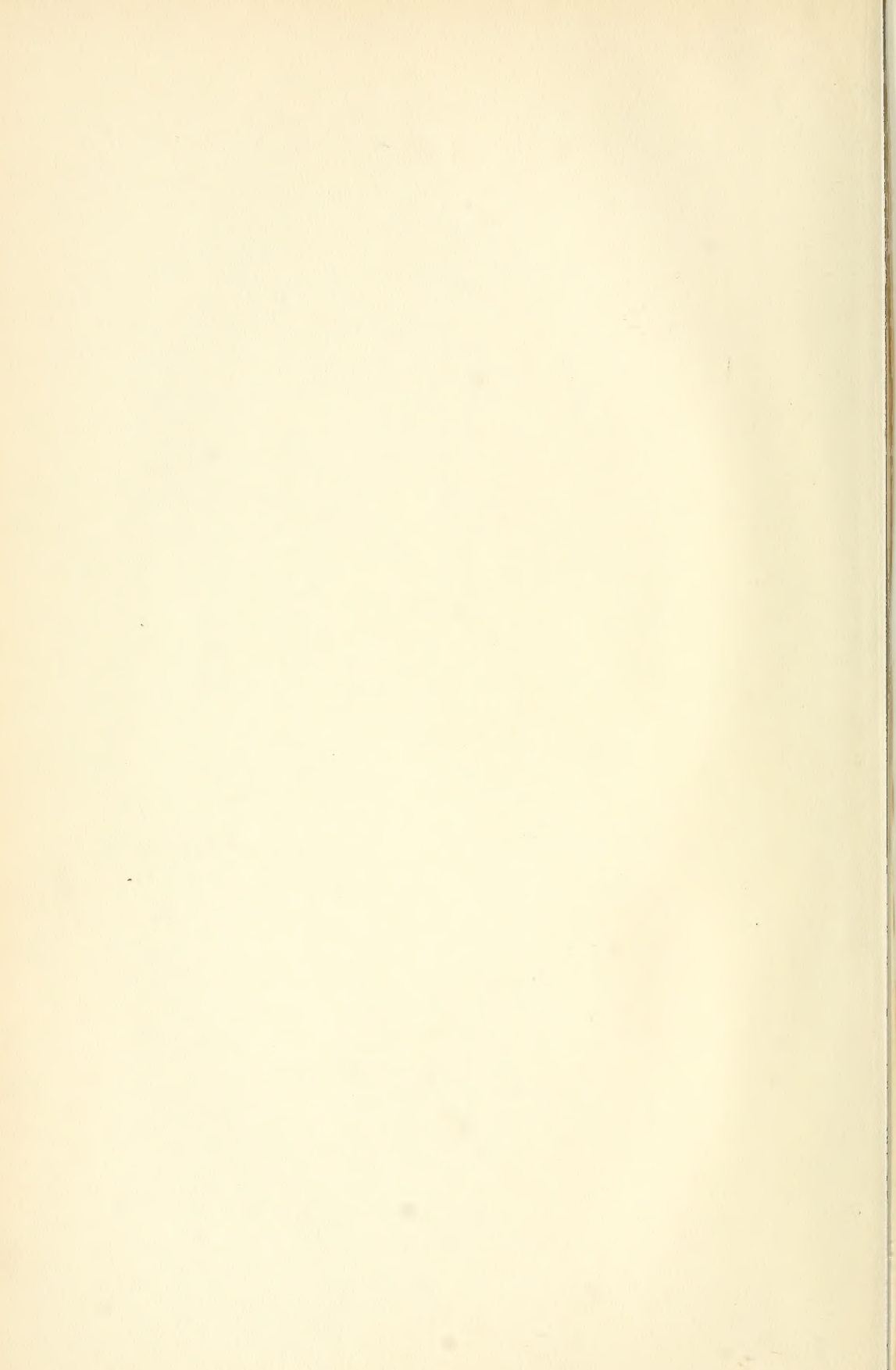


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OPHTHALMOLOGY

ESSAYS, ABSTRACTS and REVIEWS

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Original Articles.

COLOR INTERLACING AND PERIMETRY*

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In all subjective examinations the factors of personal equation, either on the part of the patient or on the part of the examiner, are often very difficult, sometimes impossible, to control sufficiently to obtain absolutely reliable results. Particularly is this true in the examination for color interlacing, where strong personal equation must be contended with not only on the part of the patient, but also on the part of the observer. Although there are various other factors which may contribute variation in the result, the double entry of personal equations doubtless adds the major part of the unknown in the result.

On the part of the examiner the personal equation is largely the result of the method of examination, and his analysis of the mental and physical condition of the patient and also of the mechanics and physics of perimetry. There is also involved a certain judgment of the accuracy of the patient's answers, only acquired after considerable experience.

On the part of the patient the personal equation is largely the result of the mental and physical condition. In both patient and examiner previous experience is an important factor.

It becomes necessary, then, in speaking of the finer perimetric changes, to outline details of the method used and of mental and physical analysis on which it is based. This discussion may be carried on more or less in the order in which the various factors may present during the course of an examination. In this way the factors to be considered may be roughly grouped in order under the following heads:

*Candidate's thesis for membership, accepted by the Committee on Thesis, American Ophthalmological Society.

1. Psychologic.
2. Physical or physiologic.
3. Mechanical.

Psychologic.—Considering a person of whom the examiner has no previous knowledge entering the “vision room,” the first step is to get an idea of the person’s mental capacity, while the visual acuity, with correction if necessary, is being carefully taken and recorded on the chart as an important part of the field record. The acuity examination in itself may throw considerable light on the person’s intelligence or may even disclose an aphasia. It always gives a clew as to what fixation ability may be expected and frequently will indicate the presence of a scotoma. A patient may read a line better backwards than forwards, and vice versa, thus giving a clew as to which side of the macular region is damaged most. This clew may be emphasized in the manner in which the head is tilted or the eye is deviated in reading.

The age, education and occupation of the patient, in case these things are not already known, are brought out in the course of a few questions to get an idea of the intelligence of the patient.

It is only rarely that children not yet old enough to go to school can be examined perimetrically. Highly educated people, scientists, engineers, etc., are apt to be so overanxious to give the best possible readings that they may get to seeing things that are not there, as it were, and especially on colors these people, as well as artists and people familiar with colors, are able unconsciously to take advantage of the percentage of chance and also to judge colors entirely by their light intensity. This latter possibility comes about from the fact that the colored test-objects show a difference in brightness or intensity of reflection before they give a sensation of their true color as they approach from the periphery. And more than this, they pass through a series of more or less neutral tints as they reach their threshold of true color perception. Most patients are conscious of this phenomenon, although their description of it will show individual variation. Thus, a blue spot when it is first detected as moving may give the same appearance as a white spot at the periphery for form; it then becomes a slate color, and turns rapidly blue as it comes farther in. Red, while it has usually a sharper threshold than blue, approaches through a similar series of neutral tints beginning with a gray, which becomes a brighter and yellowish, even brown, before it rather abruptly turns red. Green has the most unreliable threshold apparently, passes gradually through gray, straw color, yellowish, and then rather slowly and

uncertainly, as compared with the other colors, turns green as it approaches the center. For this reason green is not used so much on account of its reliability as to reduce the percentage of guess to at least 33 1-3 per cent, for most patients will begin to anticipate the next probable color when anything like a definite sequence or order of appearance is allowed to occur. This difficulty is readily overcome by an instrument which will be described briefly later.

At best, however, the first set of readings is often wrong as compared with the later readings, because the patient has not standardized his judgments, and even when his judgments have become as constant as they will, it is necessary to take the average of a number of readings, since a single reading may vary considerably from the average. Indeed, when these results are plotted on the chart they probably have an appearance of greater accuracy and definiteness than is actually present.

For the best results the form field should be made a separate examination from the color test, because it involves a different class of judgment, but, of course, all the color readings on a particular radius should be taken as nearly at the same time as possible in order to get the best possible judgments. The first few readings in both cases are apt to be wrong and must be discarded. Later averages must be recorded throughout. The reading for "white" is practically worthless because of its very confusing threshold varying through all the shades of gray. For this reason the patient is never allowed to say "white," but is forced to report first motion only.

The instruction given a patient is very important. If measurements are attempted before the patient thoroughly understands the requirements, they are, as a rule, worthless. Instructions are tempered according to the mental capacity of the patient, and must be quite labored with the mentally deficient, obtuse, drowsy, or aphasic. Any previous experience the patient may have had is taken advantage of or corrected as necessary. Three ideas must be grasped by the patient, namely, to fix the center and name the color, or report the first motion of the discs, and it is usually an advantage to inculcate the latter two ideas separately as required. Generally the form fields are taken first.

The limits of fixation ability are first to be gauged by the visual acuity and by the mental status. With vision of 20/40 to 20/200, good fixation can be obtained by enlarging the fixation spot somewhat. If it is much worse than 20/00, special mechanical devices, later to be mentioned, may be necessary. With corrected vision worse than 20/40 some sort of central scotoma can usually be

demonstrated with some of the smaller discs of the series.

The rapidity with which the discs are moved has a considerable effect on the reading, depending on the reaction time and observation power of the patient. With patients who are sluggish and disinterested, the measurements may readily be too small if the movement of the disc is not rather slow and some oscillatory motion is given to the disc while the attention is continually stimulated. A great many more acute individuals are, on the other hand, always straining for the best possible reading, and complaining that the disc moves a considerable distance before they can speak. This is usually found by repetition to be due largely by a psychologic impression and seldom represents much error. With many patients variations of 10 degrees to 15 degrees are easily gotten by variations in the rate of motion of the discs, especially with colors. The only way to control such variables is to find, by repeated trials, the speed at which the response is most satisfactory, and use that speed constantly throughout. With considerable experience this is not difficult, but beginners are apt to have their attention distracted with other details and use marked variations in speed. It must also be borne in mind that patients, while looking at the center, have their attention focused along a certain arc along which readings have been or seem about to be taken. If now an object is moved quietly along an arc in the opposite part of the field, the patient will often ignore it for some time and give a very delayed reading. It is always fair to allow the patient foreknowledge of which arc is to be used. Scraping or other noises associated with the motion of a test-object will frequently influence the reading, generally making them too large by straining the attention and stimulating psychologic impressions unduly.

Unconsciously an examiner may more or less make the readings fit whatever preconceived idea of the field he may have. I have felt the subtle pressure of this sort of thing, and have accordingly sought to take the field before making an ophthalmoscopic examination or acquiring much information about the patient other than that a field was desired. Fortunately, I have been ideally situated, with plenty of time at my disposal to carry out such a procedure. The field examination has been almost invariably the first examination I have made upon a patient, the sole idea being to get an accurate field record quite independent of the findings of others.

Physical.—Probably the most important factor contributing to accurate observation on the part of the patient is physical comfort. Unfortunately, with brain cases, where perimetric examinations

may be of most value, a comfortable position for any length of time during the examination is very difficult, sometimes impossible, to obtain. The patient should be seated in a comfortable chair, at an adjustable perimetric table, on which the patient may rest the arms. A cold iron chin-rest seems to be a great annoyance to some patients, especially hyophyseal cases, with subnormal temperature. We have therefore used a wooden chin-rest. The Helmholtz bit has been found too distracting and uncomfortable, not to say distasteful, to the patient. But still more objectionable is the fact that they cannot call the colors readily with the mouth so occupied, and pointing methods involve too much reaction time.

When fatigue comes on, as it is pretty sure to, before the examination is complete, in any of the more difficult cases there is no alternative but to allow rest periods—in some cases quite frequently. Asthenia and dizziness may require the assistance of a nurse, with pillows and props in addition to frequent rest periods.

The presence of severe headache or pain always disturbs the concentration and attention of the patient, and is often very difficult to contend with. These factors give greater variation to the readings, so that the average must be taken between greater numerical differences. Accordingly, single sets of readings are much more apt to show the condition of color interlacing. Unfortunately, this group of cases are often the ones that have choked discs and other evidence of intercranial pressure, and must be decompressed at once, so that it is difficult to wait for the infrequent periods when the headache is very slight. The field then must be taken with frequent rest periods, since the attention becomes distracted by the pain. Those cases which have temporary amaurosis often have their rest periods well regulated automatically by the amaurosis. If the patient's energy must be conserved, even at a slight sacrifice, the form field may be taken at the same time as the color fields, that is, eight readings at a setting of the plain perimeter, or many more on the perimeter I have devised, later to be described.

Mechanical.—Not infrequently the place and position in which the perimeter is placed is quite unsuitable for the best work. Thus, it may be necessary to set up a perimeter in a noisy clinic or ward, or in a room where people are passing through. Any such place where the attention of both observer and patient is continually being distracted is extremely unsuitable, yet frequently found in use because of convenience, necessity, or because the examination is not considered worthy of special arrangements. In our work we have insisted on a special room with large windows of northern exposure.

The walls facing these windows are darkened, and the examiner wears dark or blue clothes and gloves. Fields are taken as much as possible during certain hours of the day, when the lighting is best, avoiding cloudy or dull days. We have practically always been able to get our work done during these hours, but have recently installed an indirect lighting system to virtually lengthen these hours by assisting the weakening daylight as occasion may demand (Fig. 7). The temperature of the room must not be too hot or too cold, lest the patient's thoughts wander to physical discomforts.

To explain the form in which our perimetric instruments have been devised and used it will be necessary to outline what we believe to be the requirements for accurate perimetric measurements. First, with regard to the form fields. The discs should be rimless and wire handled, so that the motion detected by the patient is due entirely to the test-object and not confused with that of a carrier. The hand should be held well out of the field as the disc is made to approach the field of vision, perpendicular to the periphery at all

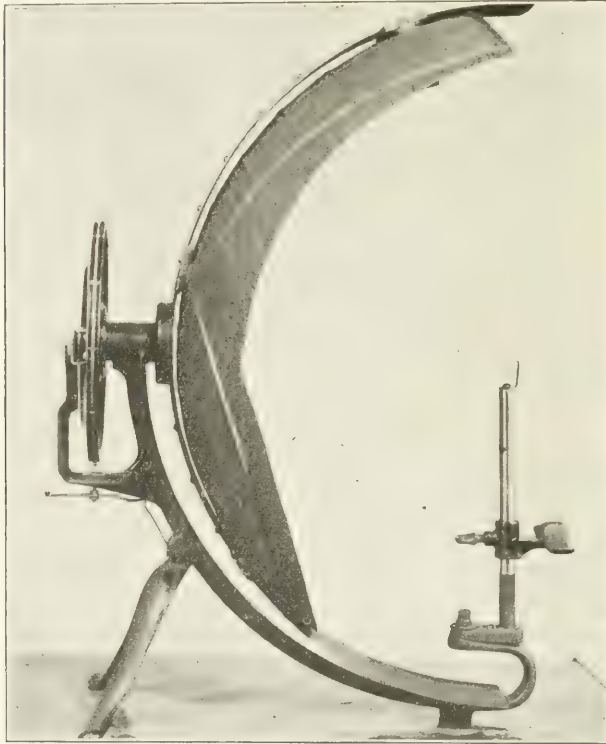


Fig. 1.—Disc series and equivalents.

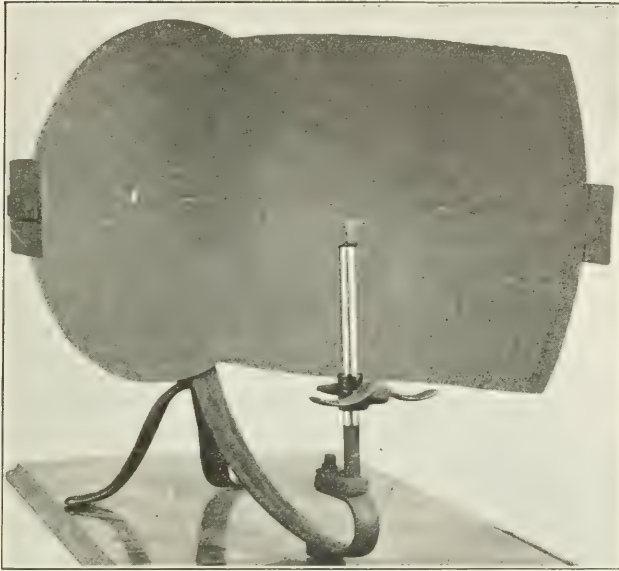


Fig. 2.—Special perimeter with wide movable face.

points. Thus, if a quadrantal defect is encountered, it is necessary to test its margins at frequent intervals along perpendiculars to its lines of clearance. It is not sufficient to get a reading of 80 degrees on the horizontal line and another at 10 degrees on the next radius, and simply connect those two points with a line. That region from 10 degrees to 80 degrees must be tested at frequent intervals in the same manner as the rest of the field. It often makes a considerable difference in the reading whether a disc is approached at right angles or tangentially to a line of clearance. Likewise in outlining scotomata the disc should be moved from the blind to the seeing field perpendicular to the visual margin. This may be quite difficult to do on the ordinary perimeter, but is very easily accomplished on our perimeter (Figs. 1-2). Again, in testing the color fields, especially with regard to the presence of color interlacing, it is necessary to be able to change the colors instantaneously without any noise of the instrument or associated motion of the hand by which the patient may anticipate or guess what has happened. To further reduce the chance to guess, at least three colors should be used, and they should be used in rather rapid succession, but seldom in the same order of sequence, the whole object being to obtain readings which represent as nearly as possible pure observation of color. We

have previously described* an instrument to fulfil these requirements.

This instrument (Fig. 3) consists of fixed and movable parts attached to rods and finger rings in the general manner of a son-sillotome. The movable rod carries at the end an essentially rimless white disc, and farther back the colors, which abut each other to get quickest possible interchanging, are protected by slight lateral rims. On the handle end of the rod are notches which lightly engage a tension spring each time a color appears at the central display opening. The spring may be regulated in tension by a double set-screw, so the click on engaging a notch is not heard at all, but barely felt by the operator. At the two end stops for colors no click, of course, is necessary. To make the white spot appear requires more force than to display the colors, since in so doing more tension is put on the spring by means of an elevating cam. The ring on the handle for the thumb is on a swivel, so that any part of the perimeter is readily reached if the fingers are entered on the same side as the colors appear. In getting the form field the white spot is made to precede the rest of the instrument, so that the first motion noted is surely not due to the handle. The colors ride very close to the beveled opening, so that practically no shadow is cast to cut down the area of the disc, and a slight allowance is made in the size of the opening to offset the light shadow present. The discs, protected as they are, do not fade or get soiled for months, and when necessary, they can be replaced by loosening a small thumb-screw on the handle, which allows all parts to be separated when the protective back at the end is slipped off. This instrument, called the color interchanger, in addition to serving well in rapid routine examinations has also been used in testing for color interlacing, as will later be described.†

The normal size of disc was always used in this instrument, but a separate series of discs for various purposes was gradually developed. Briefly, this series ranges in size above and below the normal or 5 mm. disc, so that any disc has one-half the diameter of the next larger and twice the diameter of the next smaller. Nine sizes have been found sufficient for a complete examination, the smallest being 0.15 mm. and the largest 40 mm. in diameter. These discs are essentially rimless, and two discs are carried at each end of a wire handle (Fig 5). Red and blue are back to back on one

*Walker: "Some New Instruments for Measuring Visual Field Defects," Archives of Ophthalmology.

†When this instrument is used on the new perimeter, it should be bent almost to the perimeter curvature.

end, with green and white likewise at the other end. Color discs do not extend below 1.2 mm. in size. These color discs may also be used in testing color interlacing, as will be noted later. The white series above normal are used to detect the presence of what we have called "*response to large discs*," as an index to state of optic block or atrophy in the areas blind to the normal disc. The smallest sizes are used to detect early changes within the field to the normal disc. A more detailed discussion of these phases may be found in a previous paper.‡

Central scotoma cases usually develop a seeking motion of the eye in fixation. This motion, while it may be as rapid as a very slow nystagmus, is more commonly a sluggish, roving motion, with a tendency to come to rest in a slightly eccentric position for a variable length of time. If this motion is not controlled in some way, it is, of course, conducive to color interlacing readings. Although the preliminary mapping out of the blind spot, as a check on the fixation and observation, is a routine with all cases, it is an especially valuable procedure in central scotoma cases. If the scotoma is relative, or if the central vision is better than about 20/100, one usually enlarges the fixation spot somewhat and puts a good clear letter or number on it so that satisfactory fixation, as checked by the corneal reflex and the blind spot, may be obtained. If the central vision is about 20/200 or worse, one may obtain a satisfactory check on the fixation by use of our combination blinder and macular selector (Fig 4), described in the previously mentioned papers. With this instrument the better central vision and fixation ability of the other eye is used to coördinately assist the eye with poor vision. If, however, both eyes have bad central scotoma, so that enlarged fixation discs will not give satisfactory results, even when assisted by tactile sense, one can still test the color-fields as to their relative arrangement, although their absolute arrangement with relation to the field and fixation point may have a constant error. One may arrange strips radiating from the center of the perimeter, and with the aid of tactile sense get the patient to fix on the point where these strips would seem to meet. Again, several spots may be stuck on the perimeter at points found by several approximations to lie just on the periphery of the scotoma. The patient is then required to keep all these spots in view while the peripheral field is being examined.

As we have already mentioned, we prefer a plain perimeter,

‡Walker: "A Contribution to the Study of Bitemporal Hemianopsia," *Archives of Ophthalmology*, July, 1915, XLIV, No. 4, p. 369. *Transactions of the Ophthal. Section of the Amer. Med. Assoc.*, June, 1915.

especially one of our own design, shown in Fig. 2. In stating this preference it is, of course, necessary to give our objections to the mechanical perimeters. First, as regards the color-fields, with practically all mechanical perimeters only one color-field can be taken at a time satisfactorily. This is quite favorable to the production of color interlacing, since the patient is not forced to distinguish the color, as must be done when several colors are used. In the Hare perimeter the colors can be interchanged mechanically, but the change is announced by a loud click, so that the patient has but to remember the simple sequence, and the conditions are similar, though better, than in the ordinary mechanical perimeter. Complete or a variable amount of foreknowledge concerning the color, as well as movements and sounds associated with the change of color, influences toward color interlacing readings. As has been stated in previous papers, the colors should be chosen to match the spectral tints.



Fig. 3.—Disc carrier and color interchanger.

Foreknowledge in taking the form field has to be contended with, as in the color-fields, but in a different manner. Some patients, in trying to detect the first motion of the disc in the region where they know it must approach, occasionally seem at times to mentally visualize the motion before it is actually seen. A psychologic error of this sort may be stimulated by a slight scraping of the test-object on the perimeter, or other associated noises or movements at this critical moment. This is a difficulty with most mechanical perimeters. Errors of this sort may be avoided on our perimeter by care in moving the discs, by having a large field to work in, by rapid repetition, and are made particularly noticeable when different sizes of discs are used in rapid succession, since the relation of their readings will often give an index as to which is decidedly wrong.

This naturally suggests further difficulties with the mechanical perimeters. In the first place, there is a marked tendency to record a particular reading, either the first or the last, either one of which may be wrong, rather than to grind back and forth and finally record a true average of the best readings. But, still worse, it is quite impractical to use the numerous different-sized discs in rapid succession; also rimless white spots cannot be used as we think

necessary in modern perimetry. A mechanical perimeter, with which this could be done and move the discs in the manner previously mentioned, always perpendicular to the line of field clearance, seems quite impossible at the present time. Further, regarding the movements of the discs it must be noted that mechanical perimeters cannot move the disc past the center. In working out central scotomata, with or without a connecting field defect, it is necessary for rapid and accurate work to be able to move the disc past the center until it is seen or noted to grow brighter according to the character of the scotoma. Indeed, most mechanical perimeters are not at all reliable for measurements about the center, nor can they make measurements of more than 90 degrees, although the temporal field may be over that amount.

Electric perimetry has been recently advocated, but from our standpoint is open to severe criticism. Since it is but little used, only a few of the major difficulties need be mentioned. The worst and practically insurmountable difficulty arises from the fact that

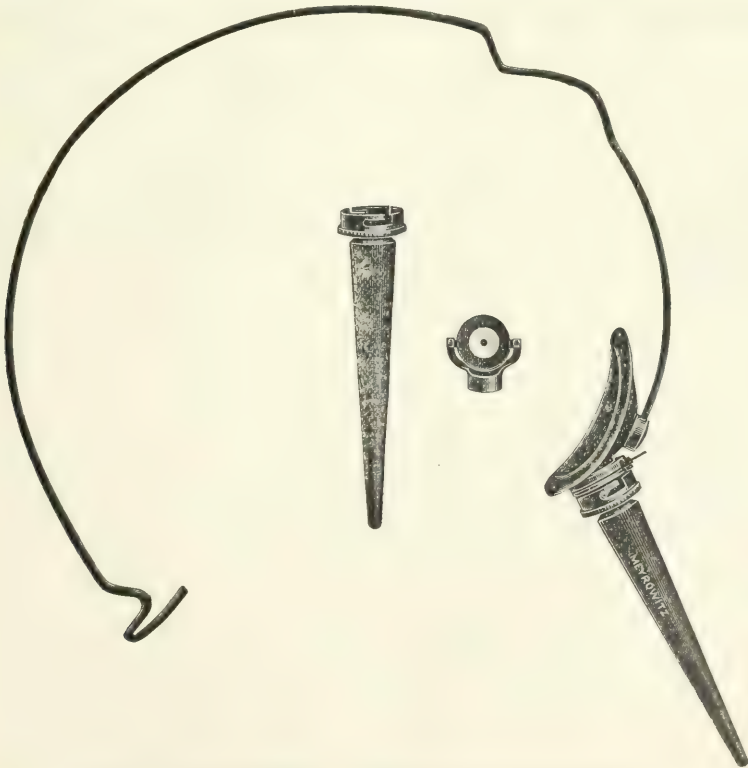


Fig. 4.—Combination blinder and macula selector.

electric perimetry, to have any advantage over ordinary perimetry, must be done in the dark with a mechanical perimeter after dark adaptation of the retina has taken place. This means fixation in the dark, and I have yet to see the patient, especially a brain case, whom I could trust to look at the center throughout a complete field examination. The eye of the patient must at all times be observed by the examiner, otherwise gross errors will certainly occur. At least such has been the case in my experience, so that for this reason, if for no other, I have discarded the method. But in addition to this major difficulty this method is heir to all the difficulties already mentioned in connection with mechanical perimeters. As for making a readable record with nine or even less different sized rimless discs and three colors by simply punching holes in the chart with any mechanical perimetric device, it seems simply out of the question. Even if these factors could be controlled, the phenomenon of dark adaptation is a troublesome factor. Although dark adaptation is largely accomplished in ten or fifteen minutes, it is not complete for from thirty to forty-five minutes. Any considerable flash of light, accidental or otherwise, during the course of the hour or two necessary to take a complete field means a further sacrifice of time for readaptation. Throughout, the sensitiveness for one size of disc will be different from that of another size, and also varies with the distance from the center. After-images also bother in this sensitive state, particularly from the fixation light or from a test light not in constant motion. It is hardly worth while here to take up, in addition, other difficulties, such as weakening batteries and lamps, pupillary reactions, drooping lids, or malpositions of the eye or head at the center post, dispersion and diffusion of the light in the vitreous, etc. Altogether we consider electric perimetry far less accurate and far more time-consuming than daylight perimetry. It may be added, however, that a battery of electric lights may be satisfactorily used to augment waning daylight or even to take fields at night. We are arranging to use nitrogen lamps covered with milk glass and fixed in a circle back of the patient's head. A rheostated battery of this sort may be made to imitate daylight conditions quite closely for emergency work (Fig. 7).

For the practical examination of difficult fields we have devised a perimeter with the largest possible surface upon which to make measurements. This was accomplished by forming a sheet of thin brass into a section of a sphere of 28.6 cm. radius. This surface was cut to extend 35 degrees about the center in three quadrants,

and 95 degrees in the remaining quadrant, with a lateral width sufficient to include three of the 30 degree lines radiating from the center. The whole surface was marked by deep numbered lines, scratched in the metal to correspond with the field chart. As may be seen in the cut (Fig. 2), this section of sphere is attached to the ordinary perimeter by means of rollers, so that "eccentric fixation" may be obtained by displacement along the arc to the desired number of degrees. This feature is useful in obtaining the maximum periphery in spite of the obstruction offered by nose, eyebrows, lids, or cheeks. The position of the arc is set at any desired 30 degree angle, and fixed in position by a spring catch. The eye is placed at 28.6 cm. from the center in order that the discs shown in Fig. 1 may be recorded in visual angles directly as indicated or in diameters. The face of this perimeter is large enough, so that by use of the smaller discs the field for the smaller visual angles can be made with much greater ease than by the comparatively awkward and laborious method of Bjerrum. These specially made small discs and their use on the perimeter are fully described in the paper previously mentioned. With a series of discs and a perimeter of this design we have been able to completely work out difficult fields according to our requirements outlined in the shortest possible time.



Fig. 5.—Practically rimless graduated discs.

With this rather brief but necessary sketch of our perimetric methods we may proceed to a study of the phenomena of color interlacing. As has been said, we began to take fields with practically no knowledge of the case. This was largely the result of the press of routine affairs. It became convenient to take the fields first, even before an ophthalmoscopic examination. The fields had, therefore, to be very carefully taken in order to get, if possible, a field that would stand checking and rechecking if later argument arose. Before long we began using a wooden model of the described color interchanger until the instrument could be made in metal. While in one or two of our earlier fields we had found points of color interlacing, we were very rarely able to find interlacing

after we began to use the color interchanger to get rapidly averaged readings. Indeed, in the few cases where it was found papilledema or choked disc was commonly not present to account for the condition, but rather such conditions as central scotomata and poor fixation.

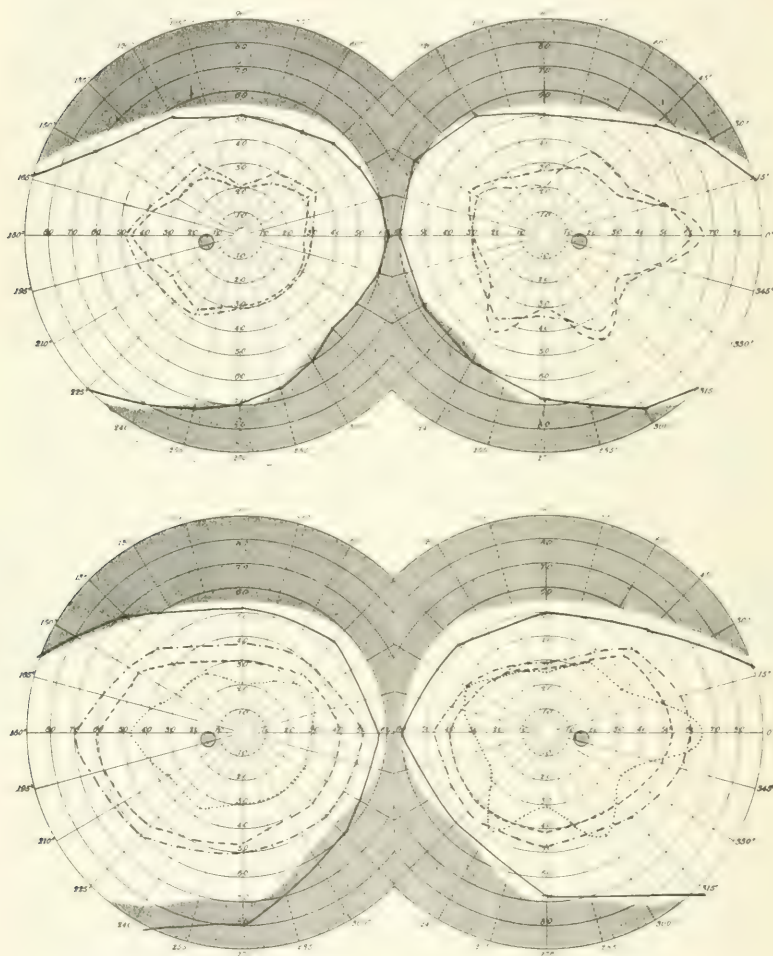


Fig. 6.—Fields taken before and after decompression, illustrating shrinkage of red field at points of interlacing, present in right eye only. The dotted lines (.....) indicate red field before operation transposed onto field after operation.

Accordingly, we began to study all the previous fields, from the very first, taken in the neurologic surgical clinic of Professor Harvey Cushing. A record was made in each case of the diagnosis,

presence of papilledema, or choked disc, and its measurement in diopters, the presence or absence of color interlacing, operations, the mental condition of the patient, as well as the presence of pain, and various conditions which would have a bearing on perimetry. Also the name of the observer was recorded with each field as an index of whatever personal equation might exist on that score. Bearing on the question of color interlacing, 405 fields were found taken on 132 cases by 14 observers in the Johns Hopkins Hospital clinic, and 245 fields taken on 83 cases by 12 observers in the Peter Bent Bringham Hospital clinic.

Before proceeding to a discussion of the results of this study, mention should be made of the methods used by the various observers. The color tints used by all the observers were practically the same, being colored mat papers selected to match the spectral colors. Beyond this, the technic and equipment varied. The following procedure had long been in vogue at the Baltimore clinic. Green was rarely used. Red and blue circular discs, 5mm. in diameter, were fixed on opposite sides of a black disc, about the size of a silver half-dollar. A standard plain perimeter was used. When one color reading had been made, the discs were either withdrawn from the color field and rotated for the other color reading, or where more care was used it was withdrawn back of the perimeter arc and carried out to 90 degrees still behind the arc, to be again advanced on the face of the arc for a repetition of the previous reading or, if it had been rotated meanwhile, for a reading of the other color. The latter process occupied a longer time interval than was best, but was better than rotating the large disc while still readily noticeable to the patient in the peripheral field.

In our own, and largely among the observers at the Boston, a variety of tests have been used in a routine manner. First, with the color interchanger, certain critical tests may be made. One may carry the red color to the periphery for red, and, while still holding the attention of the patient, noiselessly and quickly change to blue, when if inversion is present, no color will be called, otherwise blue will be at once detected. Green may be introduced in the same manner not only to find its periphery, but also to reduce the chance of guess. Again, the blue periphery may be found, then, when red is suddenly interchanged with the blue, it will not be called until it is brought nearer the center if interlacing is not present. Also the colors may be continuously and rapidly interchanged as the instrument is carried slowly along the arc, noting which color is first called. A very similar test may be per-

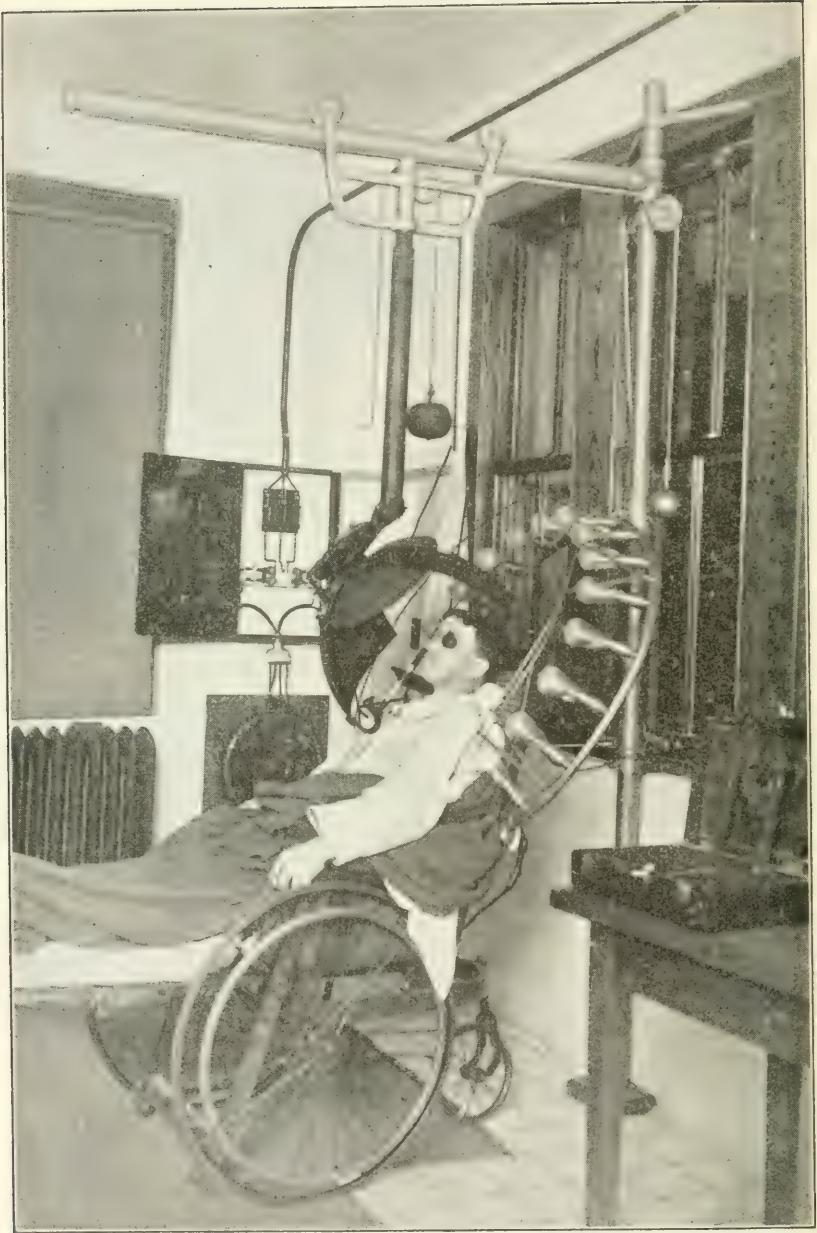


Fig. 7.—Special perimeter (of Fig. 2) mounted on suspension apparatus and artificially illuminated by tungsten lamps (eight 60 watt and eight 40 watt) alternately placed and controlled from switchboard rheostat.

formed with plain rimless discs. Red and blue or red, blue, or green discs may be fixed on the end of a rod, so that they can be made to approach the center abreast, and it is noted which color is detected first. In this case the colors must be detachable, so that the order can be rearranged each time. A series of *different sized colors* also offer a check, for it has been noted that, when considerable uncertainty is present with colors of 5 mm. and smaller, so that the readings are close together, with somewhat larger sizes the relations may become more distinct.

The main object of our tests is to force the patient to make color readings, which at all times require the color to be distinguished and differentiated, as a means of detecting and discarding the numerous errors that certain patients may make when wrought up by examination to the psychologic condition in which every moving object in the periphery apparently has some color, and also to detect in time the point where weariness or ennui drives the patient to random guessess and hurried answers in order to shorten the examination. But whenever readings are recorded at any time, they must represent the averages rather than single observations.

TABULATED REVIEW OF FIELDS FOUND IN JOHNS HOPKINS HOSPITAL RECORDS.

It was found very difficult to tabulate and present in a reasonable extent of space the large amount of data gathered in connection with the study of the great number of fields taken in Professor Cushing's Baltimore Clinic, and having relation to the subject of color interlacing. After struggling with this data for a considerable period it was decided that the following data would perhaps give a satisfactory amount of information. In the first column the surgical number of the first admission is given, and readmissions are noted in the second column, which is used for the most part to indicate whether the field was taken before or after operation. All cases were recorded as "before" until an operation was performed, and then recorded as "after." Sometimes no operation was performed and sometimes no fields were gotten after operation, for various reasons, so that the number of "befores" considerably exceed the "afters." The operation, performed, was always some form of decompression—transphenoid, subtemporal, or suboccipital. In the third column was placed the diagnosis. In the fourth column it placed the condition of the optic disc, using the abbreviations "C. D." for "choked disc," and "O. U." for "both eyes." Likewise, in the fifth column the presence of color interlac-

ing in the fields is indicated by the letters "C. I.," and its absence by "No C. I." If two fields are taken by the same observer, and showing the same characteristics, it is noted in the sixth column as "2 f." In the last column the examiner who took the field is indicated by an arbitrary letter chosen at random.

To segregate the cases into well-defined groups was also found difficult, because of the numerous cases which would appear in more than one group if the differentiation was at all strict. Accordingly, to avoid placing a case in more than one group it was classified with respect to the predominate characteristics under discussion, and the complete record was placed under one number—the surgical number of the first admission. This arrangement seemed to render variations more easily traceable than to record the same case in more than one group. Apparently the following five groups were as satisfactory as any that could be arranged:

- I. Optic discs normal or with atrophic pallor, but often showing color interlacing.
- II. Optic discs edematous, though not measurably elevated, but often showing no color interlacing.
- III. Optic discs edematous, though not measurably elevated, but often showing color interlacing.
- IV. Optic discs measurably elevated without color interlacing.
- V. Optic discs not measurably elevated with color interlacing present in one or both eyes.

In the first group, where color interlacing was present, when the fundus and optic discs were found normal in appearance or even when the disc showed the pallor of atrophy, it is strikingly notable that, although the patient entered the hospital under suspicion of having intercranial pressure due to a new growth, it was frequently demonstrated later that such was not the case. The final diagnosis in these cases may have been paraclonus multiplex, idiopathic epilepsy, osteoma of skull, labyrinthine vertigo, hyperthyroidism, arteriosclerosis, migraine, or pseudo brain-tumor. And still more strikingly negative were the cases found to have hypophyseal struma. The optic discs on these patients not only showed no evidence of intracranial pressure, but rather the pallor of optic atrophy or physiologic blocking of the optic nerve, frequently without the formation of an internal hydrocephalus which could dilate the sheath of Schwalbe. One might feel then that the explanation of color interlacing was not obvious on anatomic grounds, and turn to the observers. Here may be found a considerable variation. Some observers find color interlacing frequently and others do not.

This is well shown in No. 28132, a case of hypophyseal struma on which four observers took fields before operation, with proportionate variation in result, and also the different observations of the same examiner "A" are noted to vary on the same case.

In contrast to the first group, the second group shows many observations of no color interlacing, although the optic discs showed evidence of cerebral pressure, often not measurably elevated, but the presence of cerebral tumor or pressure was later confirmed in many of the group. Here also color interlacing may be found by one observer, not by another observer under the same conditions. After operation color interlacing is rarely found, no matter what the condition of the optic disc may be. Before operation in several cases it was not found in the first field, but in the second field usually by a different observer.

In the small third group color interlacing was found always before operation, and the optic discs were edematous, but not measurably elevated. As a rule, only one field was taken before operation. In two cases, the third and the last, color interlacing persisted after the decompression. In three other cases it was not found after operation.

In the fourth group are found a large number of cases with measurable choked discs, but no color interlacing before operation, with the single exception of the first case, where the second field showed color interlacing. In this same case, and in two others in the group, color interlacing was noted after operation and measurable elevation was still present, but for the most part the field is recorded free from color interlacing after the decompression, no matter what grade of choked disc persists.

In the fifth group, with measurable choked discs, color interlacing was found sometimes in one eye only before operation. After operation, with measurable choked disc still present, nine cases are recorded with color interlacing present in one or both eyes, and nine cases with color interlacing absent in both eyes under the same conditions. Four other cases are variable in this respect, having fields which both do and do not show color interlacing. Two of these instances occurred with the same observer and two with different observers.

Considering the entire number of fields, presented in a manner as unbiased as possible, with no particular consideration of the fields beyond the indication as to the presence or absence of color interlacing, it would appear that, although there is some evidence that the presence of color interlacing bears a relation to intracranial

pressure, there is even stronger evidence that personal equation on the part of the observer, as well as that of the patient, may go far in accounting for the results. But further insight into the question may be obtained by studying the character of the fields and color interlacing as found in the records. The papers dealing with the subject of color interlacing present cases and fields showing the best and most characteristic examples bearing on the question, so that a study of these typical cases will satisfactorily cover the ground.

DISCUSSION OF PREVIOUS PAPERS.

The proposition of color interlacing as an index of intercranial pressure rests largely, if not wholly, on the evidence submitted in two papers. The first of these* shows some of the very early fields taken in Professor Cushing's clinic at the Johns Hopkins Hospital. There is no mention of perimetric technic beyond the indication of the character of colors used. In over half of the fields the visual acuity is not given, and in others where it was given, or where it has since been looked up, it was so poor, sometimes less than 8/200, that poor fixation alone could account for the interlacing found in markedly contracted color-fields, and possibly might also account for the abnormal condition (Fig. 2*, Surg. No. 15893), where the form field is shown running for some distance inside both color-fields to the same size of disc.

The peculiar behavior of the field for red in a large percentage of the fields showing color interlacing before but not after operation, must also be noted. This peculiarity occurs in two out of four such cases in the first paper, and all except possibly one of seven such cases in the second paper.† At the points of interlacing, before operation, the reading for red may be recorded not only wider than the normal average for 5 mm. discs, but also considerably wider at these points than is found after decompression, when all other measurements except those for red in the interlaced regions have shown great improvement. In other words, the field for red has contracted after decompression, particularly at the points of interlacing readings, while practically all the other readings in the field, both for color and form, have expanded. This phenomenon is well shown in Fig. 6, which is a reproduction of the fields for Case IV in the second paper. In the left eye no color interlacing was found before operation, and marked improvement is noted in all the readings after operation, while in the right eye, where color interlacing was

*Bordley & Cushing: Archives of Ophthalmology, 1909, xxxvii, No. 5.

†Cushing and Heuer: Jour. Amer. Med. Assoc., 1911, lvii, 200.

found, the readings for red contracted after operation at the points where interlacing took place, although all the other readings for color showed considerable increase. This is shown more clearly in any of the cases by transposing the red field before operation on to the red field after operation for comparison, as has been done in Fig. 6. It will then be noted that, while the blue field almost always improves after operation, the red field may contract at points of interlacing, or, in less marked cases than the one shown, may remain stationary while the rest of the field improves. The amount of shrinkage of the red field at these points may be marked. Thus, in the right eye of Case 9, Figs. 15 and 16, it is almost 20 degrees.

Color interlacing is not accounted for in the papers by this phenomenon, but by the occurrence of peripheral scotoma for blue. If the peripheral scotomatous damage does occur for blue, it does not seem obvious why the vision for red should be improved in those same damaged regions to such a marked degree. In my own experience the peripheral damage to the color-fields before decompression and the recovery afterwards have been seen to proceed much more uniformly. If anything, the color-fields have suffered more in the inverse order of their size, that is, peripheral blue vision has been more commonly seen preserved to the last, and green vision damaged or lost first, with later failure for red. Likewise, the last to go has commonly been the first to return after operation. Exceptions to this order have usually been in cases of centrally situated scotomata, either of syphilitic or other toxic etiology, or in cases not of cerebral tumor origin. Altogether we have felt that the explanation of color interlacing as it has been found in the past is to be found in the psychology of perimetry, personal equation, headache and other uncontrolled discomforts of the patient as well as inferior apparatus.

FINDINGS IN THE PETER BENT BRIGHAM CLINIC

Regarding cases having choked disc or suspected intercranial pressure, examined in Professor Cushing's clinic at the Peter Bent Brigham Hospital, there is not a great deal to say concerning color interlacing beyond the fact that it has not been found except once by an intern taking his first field on a patient who had no pressure manifestations. The fields for red and blue have been seen very close together, even in contact, and bizarre readings have been obtained on very sick patients or patients suffering intense headache, but these conditions always realigned themselves when the patient was carefully examined in an interval when free, or almost free, from pain and in a comfortable position. Apparently color

OPTIC DISCS NORMAL OR WITH ATROPHIC PALOR BUT OFTEN SHOWING COLOR INTERLACING (42 CASES)

Surg. No.	Operation	Diagnosis	Fundi	Fields	Num-ber	Exami-ner
24923	Before	Paracornus multiplex	O. U. No C. D.	O. U. C. I.	1 f	H
26270	Before	Epilepsy	O. D. No C. D.	O. U. C. I.	1 f	H
23887	Before	Epilepsy	O. S. No C. D.	O. U. C. I.	2 f	F
20071	After	Epilepsy	O. U. No C. D.	O. U. C. I.	1 f	F
24408	Before	Epilepsy	O. U. No C. D.	O. U. C. I.	1 f	D
	After		O. U. No C. D.	O. U. C. I.	1 f	F
26747	Before	Osteoma skull	O. U. No C. D.	O. U. C. I.	2 f	F
28134	Before	Epilepsy	O. U. No C. D.	O. U. C. I.	1 f	H
28219	Before	Hypophyseal struma	O. U. No C. D.	O. U. C. I.	1 f	I
22665	Before	Hypophyseal struma	O. U. No C. D.	O. U. C. I.	1 f	F
27580	Before	Labyrinthine vertigo	O. U. No C. D.	O. U. C. I.	1 f	H
24407	Before	Encceph. malacia	O. U. No C. D.	O. U. C. I.	1 f	I
26333	Before	Epilepsy	O. U. No C. D.	O. U. C. I.	1 f	F
25806	Before	Hypophyseal struma	O. U. No C. D.	O. U. C. I.	1 f	H
	After		O. U. No C. D.	O. U. C. I.	1 f	H
28132	Before	Hypophyseal struma	O. U. No C. D.	O. U. C. I.	1 f	H
			O. U. No C. D.	O. U. C. I.	1 f	A
			O. U. No C. D.	O. U. C. I.	2 f	F
			O. U. No C. D.	O. U. C. I.	1 f	F
			O. U. No C. D.	O. U. C. I.	1 f	G
24104	After	Osteoma skull	O. U. No C. D.	O. U. C. I.	1 f	A
*27104	Before	Hypopituitarism	O. U. No C. D.	O. U. C. I.	2 f	F
27414	Before	Epilepsy	O. U. No C. D.	O. U. C. I.	1 f	I
27397	Before	Epilepsy	O. U. No C. D.	O. U. C. I.	1 f	J
	After		O. U. No C. D.	O. U. C. I.	1 f	H
28708	Before	Hyperthyroidism	O. U. No C. D.	O. U. C. I.	1 f	H
			O. U. No C. D.	O. U. C. I.	1 f	G
25694	Before	Hyperthyroidism	O. U. No C. D.	O. U. C. I.	2 f	G
			O. U. No C. D.	O. U. C. I.	1 f	H
			O. U. No C. D.	O. U. C. I.	1 f	H
*27238	Before	Hypopituitarism	O. U. No C. D.	O. U. C. I.	1 f	I
			O. U. No C. D.	O. U. C. I.	1 f	E
			O. U. No C. D.	O. U. C. I.	1 f	G

OPTIC DISCS EDEMATOUS BUT NOT MEASURABLY ELEVATED BUT OFTEN SHOWING NO COLOR INTERLACING (16 CASES)

Surg. No.	Operation	Diagnosis	Fundi	Fields	Num-ber	Exam-iner
29601	Before and after.	Temp. lobe tumor	O. U.	O. U.	3 f	E
25463	Before	Brain tumor	C. D., low grade.	O. U.	2 f	H
29181	Before	Epilepsy	O. U.	O. U.	1 f	H
	Before		O. U.	O. U.	1 f	A
	Before		O. U.	O. U.	1 f	E
25645	Before	Brain tumor	O. U.	O. U.	1 f	D
	Before	Brain tumor	O. U.	O. U.	1 f	H
	Before	Brain tumor	O. U.	O. U.	1 f	H
23689	Before	Brain tumor (?)	O. U.	O. U.	1 f	H
27322	Before	Brain tumor	O. U.	O. U.	1 f	H
*26369	After	Brain tumor	O. U.	O. U.	1 f	I
	After		O. U.	O. U.	1 f	H
25600	Before	Brain tumor	No C. D.	O. U.	1 f	H
26076	Before	Osteoma	Edematous sec. changes	O. U.	1 f	H
21674	Before	Brain tumor	C. D., low grade	O. U.	1 f	E
25068	Before	Hypophyseal tumor	Edematous	O. U.	1 f	E
25053	Before	Art. sclerosis	C. D., low grade	O. U.	1 f	H
26454	Before	Brain tumor	Edematous	O. U.	1 f	C
	Before		C. D. not measurable	O. U.	1 f	H
	Before		C. D. not measurable	O. U.	1 f	H
	After		C. D. not measurable	O. U.	1 f	H
	After		C. D. not measurable	O. U.	1 f	I
	After		C. D. I D.	O. U.	1 f	I
26980	Before	Brain tumor, epilepsy	Disc elevated I D.	O. U.	1 f	H
	Before		C. D. edematous not meas.	O. U.	1 f	H
	Before	Brain tumor, epilepsy	C. D. edematous not meas.	O. S.	1 f	H
24942	Before	Brain tumor	C. D. edematous not meas.	O. U.	1 f	H
*25435	Before	Int. hydrocephalus	Edematous low grade C. D.	O. U.	1 f	H
	After	Int. hydrocephalus	Edematous low grade C. D.	O. U.	1 f	H
24882	Before	Cerebral edema, pseudo tumor, hysteria	Edematous	O. U.	1 f	H
	Before		Edematous veins en- gorged	O. U.	1 f	H
29787	Before	Brain tumor	O. U. Very edematous, veins engorged and tortuous.	O. U.	4 f	E

*Readmission.

OPTIC DISC NOT MEASURABLY ELEVATED BUT COLOR INTERLACING PRESENT (7 CASES)

Surg. No.	Operation	Diagnosis	Fundi	O. U.	C. I.	Num-ber	Exam-iner
24033	Before	Brain tumor	Receded (?) C. D.	O. U.	C. I.	1 f	F
23604	Before	Brain tumor (?)	O. U. Edematous	O. U.	C. I.	1 f	F
	After	Uncinate fits	O. U. Same	O. U.	No C. I.	1 f	F
19853	Before	Brain tumor (?)	O. U. C. D. not measurable	O. U.	C. I.	1 f	D
	After		No C. D. O. U.	O. U.	C. I.	1 f	D
*19636			O. U. C. D. not measurable	O. U.	C. I.	1 f	D
28674	Before	Cerebellar tumor	O. U. No C. D. hyperemic	O. U.	No C. I.	1 f	G
	After		O. U. No C. I.	O. U.	C. I.	1 f	G
23482	After	Brain tumor	O. U. sl. edema	O. U.	No C. I.	1 f	A
	After		O. U. disc. color	O. U.	Contact	1 f	F
23779	Before	Acromegaly	O. U. No C. I.	O. D.	C. I.	1 f	
	Before		sl. edema	O. U.	C. I.	2 f	H
26847	Before	Brain tumor	O. U. No C. D.	O. U.	C. I.	1 f	H
	After		O. S. Edematous	O. S.	No C. I.	1 f	
			O. U. elevated 2 D.	O. D.	No C. I.	1 f	

*Readmission.

MEASURABLE CHOKED DISC WITHOUT COLOR INTERLACING (41 CASES)

Surg. No.	Operation	Diagnosis	Fundi			Fields			Num-ber	Exam-iner
24852	Before	Brain tumor	O	U	C	O	U	No C. I.	1	K
	After		O	U	C	O	U	No C. I.	1	H
27675	Before	Hypophyseal tumor	O	U	C	O	U	No C. I.	1	H
	After		O	U	C	O	U	No C. I.	1	H
23725	Before	Hypophyseal tumor	O	U	C	O	U	No C. I.	1	J
24921	Before	Brain tumor	O	U	C	O	U	No C. I.	1	J
27679	Before	Cerebellar tumor	O	U	C	O	U	No C. I.	1	F
29771	Before	Brain tumor	O	U	C	O	U	No C. I.	1	F
	After		O	U	C	O	U	No C. I.	1	F
25117	Before	Brain tumor	O	U	C	O	U	No C. I.	1	E
*27733	After		O	U	C	O	U	No C. I.	1	E
28125	Before	Cerebellar tumor	O	U	C	O	U	No C. I.	1	H
+29920	After		O	U	C	O	U	No C. I.	1	H
26651	Before	Brain tumor	O	U	C	O	U	No C. I.	1	I
25832	After	Brain tumor	O	U	C	O	U	No C. I.	1	E
22691	After	Brain tumor	O	U	C	O	U	No C. I.	1	H
27788	Before and after	Cerebellar tumor	O	U	C	O	U	No C. I.	1	F
28986	After	Hypophyseal tumor	O	U	C	O	U	No C. I.	1	D
	After		O	U	C	O	U	No C. I.	1	D
29395	Before	Hypophyseal tumor	O	U	C	O	U	No C. I.	1	I
	After		O	U	C	O	U	No C. I.	1	C
26194	Before	Brain tumor	O	U	C	O	U	No C. I.	1	E
29935	Before	Brain tumor	O	U	C	O	U	No C. I.	1	C
	After		O	U	C	O	U	No C. I.	1	E
29289	Before	Hypophyseal tumor	O	U	C	O	U	No C. I.	1	E
27885	Before	Brain tumor	O	U	C	O	U	No C. I.	1	E
29921	Before	Brain tumor	O	U	C	O	U	No C. I.	1	J
27300	Before	Brain tumor	O	U	C	O	U	No C. I.	1	E
19941	Before	Brain tumor	O	U	C	O	U	No C. I.	1	H
	After		O	U	C	O	U	No C. I.	1	D
28096	Before	Osteoma skull	O	U	C	O	U	No C. I.	1	D
	After		O	U	C	O	U	No C. I.	1	I
29903	After	Cerebellar tumor	O	U	C	O	U	No C. I.	1	I
27686	Before	Brain tumor	O	U	C	O	U	No C. I.	1	E
29996	Before	Brain tumor	O	U	C	O	U	No C. I.	1	E
	After		O	U	C	O	U	No C. I.	1	C
	After		O	U	C	O	U	No C. I.	1	E

28861	Before	Cerebellar tumor	O. U.	C. D.	2 D.	O. U.	No C. I.	1	E
30210	Before	Brain tumor	O. U.	C. D.	3 D.	O. U.	No C. I.	2	C
	After		O. U.	C. D.	3 D.	O. U.	No C. I.	3	E
28084	Before	Brain tumor	O. U.	C. D.	4 D.	O. U.	No C. I.	1	F
29248	Before	Brain tumor	O. U.	C. D.	5 D.	O. U.	No C. I.	2	F
28332	Before	Cerebellar tumor	O. U.	C. D.	3 ½ D.	O. U.	No C. I.	3	E
28595	Before	Cereb. syphilis	O. D.	No C.	D.	O. U.	No C. I.	1	E
	Before		O. S.	C. D.	1 ½ D.	O. U.	No C. I.	2	G
	Before		O. S.	C. D.	1 ½ D.	O. U.	No C. I.	1	B
28828	Before	Specific neuroretinitis	O. U.	C. D.	3 D.	O. U.	No C. I.	1	G
29162	Before	Brain tumor	O. U.	C. D.	3 D.	O. U.	No C. I.	1	E
28981	Before	Brain tumor	O. U.	C. D.	3 D.	O. U.	No C. I.	1	L
	Before		O. U.	C. D.	3 D.	O. U.	No C. I.	1	X
29813	Before	Brain tumor	O. U.	C. D.	2 D.	O. S.	No C. I.	1	E
29128	Before	Brain tumor	O. U.	C. D.	7 D.	O. U.	No C. I.	1	E
28681	Before	Brain tumor	O. U.	C. D.	2 D.	O. U.	No C. I.	1	G
29335	Before	Cerebellar tumor	O. U.	C. D.	2 ½ D.	O. U.	No C. I.	1	E
27554	After	Brain tumor	O. U.	C. D.	1 D.	O. U.	No C. I.	1	I
	After		O. U.	C. D.	1 D.	O. U.	No C. I.	1	I
25224	Before	Brain tumor	O. U.	C. D.	4 D.	O. U.	No C. I.	1	H

*Readmission. †Readmission for relief of pressure.

MEASURABLE CHOKED DISC WITH COLOR INTERLACING IN ONE OR BOTH EYES (37 CASES)

Surg. No.	Operation	Diagnosis	O.	U.	C.	D.	Fundi	Fields	Num-ber	Exam-ner
27345	Before	Brain tumor	O.	U.	C.	D.	3 D.	C. I.	1 f	J
27513	Before	Brain tumor	O.	U.	C.	D.	5 1/2 D.	C. I.	1 f	I
27186	Before	Brain tumor	O.	U.	C.	D.	3 1/2 D.	C. I.	1 f	H
27619	Before	Brain tumor	O.	U.	C.	D.	3 1/2 D.	C. I.	1 f	Z
	After	Brain tumor	O.	U.	C.	D.	4 D.	No C. I.	1 f	J
27700	Before	Cerebello pontine tumor	O.	U.	C.	D.	2 D.	C. I.	1 f	I
28283	Before	Brain tumor	O.	U.	C.	D.	6 D.	C. I.	1 f	H
27149	Before	Brain tumor	O.	U.	C.	D.	6 D.	C. I.	1 f	H
21654	Before	Brain tumor	O.	U.	C.	D.	3 D.	C. I.	1 f	D
22488	Before	Brain tumor	O.	U.	C.	D.	3 D.	C. I.	1 f	D
22551	Before	Brain tumor	O.	U.	C.	D.	2 D.	C. I.	1 f	F
23479	Before	Brain tumor	O.	U.	C.	D.	No C. I.	C. I.	1 f	F
24137	Before	Brain tumor	O.	U.	C.	D.	3 D.	C. I.	1 f	H
	After	Brain tumor	O.	U.	C.	D.	2 D.	C. I.	1 f	H
24307	Before	Brain tumor	O.	U.	C.	D.	6 D.	C. I.	1 f	F
24802	After	Brain abscess	O.	U.	C.	D.	2 D.	C. I.	2 f	F
27075	Before	Brain tumor	O.	U.	C.	D.	4 1/2 D.	C. I.	2 f	H
27131	Before	Brain tumor	O.	U.	C.	D.	3 D.	No C. I.	1 f	I
	After	Hypophyseal tumor	O.	U.	C.	D.	3 D.	C. I.	1 f	I
27619	Before	Hypophyseal tumor	O.	U.	C.	D.	3 D.	C. I.	1 f	I
	After	Hypophyseal tumor	O.	U.	C.	D.	3 D.	C. I.	1 f	I
26390	Before	Brain tumor	O.	U.	C.	D.	4 D.	C. I.	1 f	Y
	After	Brain tumor	O.	U.	C.	D.	1 D.	C. I.	1 f	J
23857	Before	Brain tumor	O.	U.	C.	D.	1 D.	No C. I.	1 f	H
	After	Brain tumor	O.	U.	C.	D.	1 1/2 D.	No C. I.	2 f	F
26252	Before	Brain tumor	O.	U.	C.	D.	4 D.	Contact	1 f	F
	After	Brain tumor	O.	U.	C.	D.	3 D.	C. I.	1 f	F
24778	Before	Brain tumor	O.	U.	C.	D.	7 D.	No C. I.	1 f	H
	After	Brain tumor	O.	U.	C.	D.	5 D.	C. I.	2 f	H
24398	Before	Brain tumor	O.	U.	C.	D.	5 D.	No C. I.	1 f	H
	After	Brain tumor	O.	U.	C.	D.	1 D.	C. I.	1 f	J
23559	Before	Angioma meninges	O.	U.	C.	D.	1 1/2 D.	No C. I.	1 f	F
	After	Angioma meninges	O.	U.	C.	D.	3 D.	No C. I.	1 f	F
23551	Before	Brain tumor	O.	U.	C.	D.	4 D.	C. I.	1 f	F
	After	Brain tumor	O.	U.	C.	D.	3 D.	C. I.	1 f	F
	After	Brain tumor	O.	U.	C.	D.	2 D.	No C. I.	2 f	D
	After	Brain tumor	O.	U.	C.	D.	1 D.	No C. I.	1 f	E

27399	After	Brain tumor	O. U.	C. D.	2½ D.	O. U.	C. I.	1 f	I
27384	Before	Cerebellar tumor	O. D.	C. D.	4 D.	O. D.	C. I.	1 f	I
	After		O. S.	C. D.	5 D.	O. S.	No colors	1 f	I
			O. D.	C. D.	3 D.	O. U.	No C. I.	1 f	I
25790	Before	Brain tumor	O. S.	C. D.	3 D.	O. S.	No C. I.	1 f	H
	After		O. U.	C. D.	5 D.	O. U.	No C. I.	2 f	H
24920	Before	Brain tumor	O. U.	C. D.	2 D.	O. U.	No C. I.	1 f	H
	After		O. D.	C. D.	8 D.	O. S.	No C. I.	1 f	H
25339	Before	Brain tumor	O. S.	C. D.	6 D.	O. S.	No C. I.	2 f	H
	After		O. U.	C. D.	2 D.	O. U.	No C. I.	2 f	H
24208	Before	Brain tumor	O. U.	C. D.	1 D.	O. U.	No C. I.	1 f	D
	After		O. U.	C. D.	2 D.	O. U.	No C. I.	1 f	D
22602	Before	Brain tumor	O. U.	C. D.	1½ D.	O. U.	C. I.	1 f	F
	After		O. U.	C. D.	4 D.	O. U.	Contact	1 f	F
	After		O. U.	C. D.	3 D.	O. U.	C. I.	1 f	D
	After		O. U.	C. D.	2 D.	O. U.	No C. I.	1 f	D
26644	Before	Brain tumor	O. D.	C. D.	1½ D.	O. D.	No C. I.	1 f	D
25292	Before	Brain tumor	O. S.	C. D.	2 D.	O. S.	No C. I.	1 f	H
	After		O. U.	C. D.	3 D.	O. U.	C. I.	1 f	H
	After		O. U.	C. D.	3 D.	O. U.	No C. I.	2 f	H
	After		O. U.	C. D.	2 D.	O. U.	No C. I.	1 f	H
22671	Before	Brain tumor	O. U.	C. D.	3 D.	O. U.	C. I.	1 f	H
	After		O. U.	C. D.	2½ D.	O. U.	No C. I.	1 f	D
*23385	After		O. U.	No C. I.	D.	O. U.	No C. I.	1 f	D
	After		O. U.	No C. I.	D.	O. U.	No C. I.	1 f	D
*28535	After		O. U.	No C. I.	D.	O. U.	No C. I.	1 f	F
	After		O. U.	No C. I.	D.	O. U.	No C. I.	1 f	F
24119	Before	Brain tumor	O. U.	C. D.	2 D.	O. U.	No C. I.	1 f	F
	After		O. U.	C. D.	3 D.	O. U.	C. I.	1 f	F
	After		O. D.	C. D.	3 D.	O. D.	No C. I.	1 f	F
28519	Before	Brain tumor	O. S.	C. D.	3 D.	O. S.	No C. I.	2 f	F
	After		O. U.	C. D.	3 D.	O. U.	C. I.	1 f	F
	After		O. U.	C. D.	1 D.	O. S.	No C. I.	1 f	J
27583	Before	Brain tumor	O. U.	C. D.	2½ D.	O. U.	No C. I.	1 f	C
	After		O. U.	C. D.	3 D.	O. U.	C. I.	1 f	I
	After		O. U.	C. D.	1 D.	O. S.	No C. I.	1 f	I
	After		O. U.	C. D.	1 D.	O. U.	No C. I.	1 f	I

*Readmission.

interlacing will be more or less present when these and other factors are not controlled. But even in these cases, if one is willing to force the patient, even in the presence of pain, to make a number of observations as accurately as can be done under the circumstances, the average will show an absence of color interlacing.

It is interesting to note that in the few patients here who have had hysteric manifestations color interlacing has not been found. However, anything may apparently happen in hysteria, and it is quite possible that such a patient might have a liking or predilection for red or hate to recognize blue to such an extent that color interlacing or inversion would be obtained not so much from a functional as a mental derangement.

CONCLUSIONS.

1. For the detection of early pressure effects on the optic tract examination of the fields for the smallest visual angles gives the most reliable results.

2. Color interlacing is not a reliable test for cerebral pressure.

3. Most of the color interlacing found in the past in brain cases may be accounted for by a variety of variables, largely psychologic, physical and mechanical.

4. Perimetry on semi-reclining patients by artificial illumination imitating daylight has been found practical.

I wish to extend my most grateful thanks to Professor Harvey Cushing for his kind generosity in allowing me to present this particular phase of his cases.

COLOR AND ITS RELATION TO TUNE.

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A man may be regarded as having a full color sense through sight when he can recognize and name correctly red, green, white, grey, yellow and blue, under varying conditions of light and shade. A person may name a color correctly and yet not recognize it in the sense that a color normal person does. Men differ in the alertness and accuracy of their perceptions, so that persons with an equal degree of color defect may vary considerably in the correctness of their answers. This condition is observed when testing the vision of employees. When two engine drivers with a similar defect in vision are tested with semaphore arms at varying distances, one will be more frequently correct in his answers than the other. A number of apparently color normal men have much difficulty in distinguishing between pale blue and green. To have, from an emotional standpoint, a full color sense, a person should not only be able to name and recognize color, but should also have a sense of tune. An ordinary man has little more than a recognition and appreciation of simple tune, such tunes as he can whistle or hum. A person who has no sense of tune or is indifferent to tune approximates in his emotional condition to the color blind, particularly in regard to the expression of emotion by the voice. Yet it is very difficult to distinguish by emotional manifestation between a tone deaf person and one who is color blind—there is, however, a distinction, but I distrust my ability of expression to make this distinction clear in words. The tone deaf person, in my limited experience of this degenerative condition, has a voice of even more monotony in conversation than the ordinary person who is red green blind. A tone deaf person in the few I have examined in color may be defective in that respect, but I have not yet found one red green blind; a curious fact. It may be that about an equal number of persons are tone deaf or tone defective as are color blind or color defective. Whether tone deaf persons are to be found only in families in whom there is a color blind inheritance, whether the two conditions are quite distinct, whether if quite distinct each follows a law similar to the color blind law of inheritance, can only be proved by a careful investigation of the family history of persons who are found to be tone deaf. The law of transmission in defect which is found in the color blind, both

male and female, may I suspect be extended to other degenerative conditions.

The experienced mind will promptly note that there is a difference in the mental processes necessary to observe and define a physical deformity and a sense deficiency. The former is obvious to the observer, the latter may be concealed from him by mental conditions in more than ordinary development and activity. The statement "Color blindness is much more common in men than in women" is, I think true, but to decide how much more common it is not only necessary that many thousands of cases should be examined by efficient persons who use reliable tests, but also it must be remembered that the ordinary educated woman from her early youth has been training her perception in shade and color, and is much more interested and observant in such matters than is the ordinary man. I have examined an intelligent and reliable railway man whose only fault in the lantern test was that he was unable to distinguish between pale green and a dull white with a trace of yellow in it, yet he failed to see any numbers when examined by Stilling's Plates, excepting 1, 3 and 9, and on the first occasion he failed in 3. He had, therefore, a serious color defect. No doubt many of the higher types of color blind women, if their examination were confined to a lantern test, would either be judged as having a normal sense or at most as having a slight defect. As mind defects vary from idiocy to mind weakness and instability, so color or tone defects vary from blindness or deafness to abnormal indifference. It is, I think, obvious that deafness to tune and blindness to color are degenerative conditions. This may even be extended to a nation in which there is a marked absence of emotional creative genius. The defective man is unable to recognize certain wave lengths in sound or sight, and to their appeal is either deaf or blind. No doubt a mere recognition of color or of tune is a primitive condition and not much removed from what is found in animals. The evolution of sense emotion through light and sound is essentially confined to life. The discovery by the mind of natural law which exists independently of human life is a purely intellectual process, yet the intellect and sense emotion together move in evolution, the one influencing and modifying or supporting the other. In conclusion, the wave lengths of sound are different to the wave lengths of light, and it is probable that the distinction between the color blind and the color normal in the appreciation of music is that the former is not emotionally influenced by color and the other is. The evolution in the avenue

for the conduction of light or sound and in specialized cells in the brain has not led to increased acuteness in human sight or hearing; the mere perception of light and sound is more acute in many animals and birds. Apparently it has been in response to a demand of emotional evolution, a more artificial and unstable condition than is found in birds. The evolution of humanity in its highest expression is an increasing knowledge of the supreme energy responsible for the creation and continuance of life and its environment; yet evolution through the intelligence and senses of human life can never find its complete expression in an individual as it does in each variety of birds, but does so in the record of human progress and its influence through human agency upon man and woman.

THE APPEARANCE OF THE FUNDUS OCULI IN
GENERAL PARESIS, MANIC DEPRESSIVE IN-
SANITY AND DEMENTIA PRAECOX.

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SEATTLE.

Following the able paper published in 1915 by Dr. Hayward G. Thomas, my interest was aroused in this subject first by seeing at Dr. Thomas' clinic in Oakland, some well marked cases having the appearance he described with the positive Wasserman and secondly, by discovering an abundance of similar cases in my service in the Seattle City Hospital, among whom were several having mental aberration, and lastly, by the observation of exactly similar appearances in certain cases in my private practice.

These cases being studied were to an extent corroborative of the statements of Dr. Thomas. I determined, therefore, to study a series of cases which should show as far as possible whether a detailed pathological clinical and laboratory investigation of these cases would be justifiable. This series of cases answers the question as far as the writer is concerned.

Taking it for granted that all men now concede general paresis to be a cerebral lues, I examined a series of twenty-four cases fourteen of which were at the Western Hospital for the Insane at Fort Steilacoom, Washington, and ten were at the Oregon State Insane Asylum at Salem. In these twenty-four cases the porus opticus was very shallow or absent, corresponding to appearance 2 to 5 of Thomas' table, thirteen times (54%). Undue pallor of papillomacular bundle, ranging from muddy opaque to pronounced atrophy, occurred twelve times in one or both eyes (50%). Indistinctness of the disc margins due to oedema or exudate occurred in one or both eyes seventeen times (70%). The cribriform markings were clear ten times or (41%). Indistinct or absent ten times (41%). Vascular abnormality either exudate at branching or tortuosity due to angio-sclerosis occurred eighteen times (75%). Exudate on retinal vessels occurred seven times (29%). Pupils did not react to light three times or (12½%). Abnormal tortuosity of conjunctival vessels three times or (12½%). Scaphoid scapula occurred once (4¼%). If these observations are correct we have evidence then that some toxic substance is at work on the retinal vessels in seventy-five per cent. of cases examined. That the toxin is of syphilitic origin we have evidence, if we accept the teachings of Dr. Thomas, in fifty-four per cent.

Comparing now the result of observations of the twenty-eight cases of dementia praecox, we have shallow p. o. eighteen times in one or both eyes (65%). Undue pallor of p. m. bundle five times (18%). Blurred or oedematous margins occurred fifteen times (54%). Cribriform clear seven times (25%). Cribriform invisible eleven times (39%). Vascular abnormalities eighteen times (65%). Exudate on retinal vessels nine (62%). Pupils react to light twenty times (71%). Tortuous conjunctival vessels four times (14%). Scaphoid scapula nine times (35%). In this series we have vascular abnormalities at sixty-five per cent., less than in the general paretics, which may be accounted for by the greater average age of the latter which increases the arteriosclerotic incidence. Sixty-five per cent. of these cases then, according to Dr. Thomas' teachings are luetic.

Taking up next the series of manic depressives which I may say in passing were naturally nearly all of the depressed type. Shallow p. o. occurred in ten out of the fourteen cases (71%). Blurred margins and oedema ten cases (71%). Vascular abnormalities (tortuous or beady vessels) eleven cases (78%). Pupillary reaction to light in twelve cases (85%). Scaphoid scapula one case (7%). The contrast between the manic depressives with 7%, the dementia praecox with (35%), and the general paretics with (44%) of scaphoid scaupla suggests that if these three varieties of insanity have in reality syphilis as the principal etiological factor, we may be observing in general paresis the effect of acquired lues and in dementia praecox the effects of hereditary lues. In just 50% of the general paretics, the hospital records showed positive Wasserman. Records were either negative or lacking in all the dementia praecox and manic depressive cases.

It was inevitable in making such examinations that some of the more advanced cases were impossible to control on account of roving eyeball. I conclude that the percentage would be higher if more of these impossible cases could be carefully seen and studied. One general paretic had albuminuria also one each manic depressive and one katonic dementia praecox. In the remainder no evidence of nephritis was present so far as the rather complete hospital records showed. Blood pressures were not taken. Tuberculosis was known to be present in one case of dementia praecox.

In order to check these observations, I have made examinations of numerous cases of insanity including paranoia, involution psychosis, imbecility and cretinism, in one of which I saw shallow p. o. I also examined the series shown in table IV, consisting of

TABLE I—GENERAL PARESIS.

Patient	Wasser- man	Papillo- maculo- bundle	Porus Opticus	Disc Markings	Vessels of Fundus	Cribri- form Markings	Pupils	Conjunct Vessels
1B		atrophic	normal	normal	tortuous	normal	coloboma of left iris od n.	tortuous
2B *3B		atrophic atrophic	normal Thos. No. 3	normal blurred nas & sup inf margin	tortuous	distinct absent	react to light react to light	tortuous tortuous
†4B 5B	no record neg. ?	normal atrophic	deep p. o. Thos. No. 5	oedema blurr g blurred	normal tortuous	marked doubtfully indistinct normal	react to light traumatic cataract immovable dilated	tortuous normal no record
6B	spinal neg	normal	normal	blurred swollen	dark beady veins arterio-venous compression	exaggerated	os does not react	no record
7B	neg	normal	deep p. o. very large	blurred	opalescent vitreous		do not react react	normal
8B 9B		atrophic normal atrophic	poor control Thos. No. 2 atrophic	blurred	arterio venous compression		contracted react	tortuous
10B	no record	normal	atrophic normal shallow	arterio- sclerosis not clear	tortuous oedema arterior-sclerotic	indistinct opaque	no record	no record
11B	no record	atrophic	normal shallow	hazy blurred	exudate on branch'gs	fairly clear	no record	no record
12B	no record	normal	normal	blurred	dark beady veins	fairly clear	no record	no record
13B	no record	no record	shallow		veins dilated	well marked	no record	no record
14B	no record	opaque pale	normal	normal	normal	mod. excav. Thos. No. 3	no record	no record
15B	no record	low grade optic neu- ritis	absent	blurred	blurred crossings		six m/m	no record

16B	no record	absent	blurred	blurred crossings	Thos. No. 2 Thos. No. 3	no record	no record
17B		dull opaque	blurred		absent p.o. os	no record	no record
18B		dull opaque			beginning optic atrophic	no record	no record
19B		absent	sup. and inf. margins blurr'd	low grade optic neuritis		react to L. & A.	no record
20B		Thos. No. 2		exudate nasal margin	distinct		no record
21B		Thos. No. 3	red exudate	exudate		no record	no record
22B		large excavation	gray atrophy	hazy outline		react	no record
23B		absent		mild hyalitis	Thos. No. 3		no record
24B		normal		exudate inf. margins			

Cribriform Markings: *Urine—Trace album. †Scapula—Scaphoid.

TABLE II—DEMENTIA PRAECOX.

Patient	Porus Opticus	Margins	Vessels of Fundus	Cribri-form Markings	Pupils	Conjunct Vessels	Scapula.....	Wasser-man	Urine
1C Hebephrenic	Thos. No. 3 shallow	3 blurred	tortuous		coloboma of iris	tortuous	scaphoid	negative	
2C Hebephrenic		blurred	opalescent	absent	react	normal	scaphoid	no record	
3C Katatonic	Thos. No. 2	blurred	exudate veins	negative	react	normal	scaphoid	no record	albuminuria
4C	shallow		too dark		react	secretion	scaphoid	no record	S. G. 1.030
5C	normal?	3 blurred	tortuous	absent	react	normal		no record	B. P. 105
6C	atrophic	normal	oedema		react	normal		no record	ex-minister
7C	Thos. No. 4	exudate blurred	tortuous	indistinct	strong reaction		normal	no record	no record
8C	normal	normal	normal	normal	normal	tortuous	normal	no record	no record
9C Hebephrenic	absent	os sup. & inf. blurred	veins too dark toxic type	oedema indistinct	normal	normal	no record	no record	no record
10C Katatonic	central		covered with exudate	Thos. No. 3	normal	normal	normal	no record	no record
11C Katatonic	absent punched	blurred	covered with exudate	present	normal	normal	normal	no record	no record
12C Paranoid	absent	Thos. No. 4		muddy	normal	normal	normal	no record	no record
13C Katatonic	shallow			exudate	no reaction	normal	normal	no record	no record
14C Hebephrenic	deep od small os			muddy	dilated	normal	normal	no record	no record
14C Katatonic	absent	moderate neuro- retinitis			3 m/m	tortuous	normal	no record	no record

15C Paranoid	present	hazy swollen	sup. & inf. covered with exudate	distinct	normal	normal	normal	no record
16C Hebephrenic	normal		arteries too small	distinct	normal	normal	normal	no record
17C Hebephrenic	absent	sup. & inf. exudate	mod. neuro-retinitis		normal	normal	normal	no record
18C	present	blurred	normal?	distinct	normal	normal	normal	no record
Katatonic	absent	neuro-retinitis	white opacity fills p. o.		normal	normal	normal	no record
19C	absent		exudate disc		normal	tortuous	normal	Dad Al-
Katatonic	absent		vessels normal	present	normal	tortuous	normal	buninuria
20C	shallow				normal	tortuous	normal	no record
Hebephrenic	present				normal	tortuous	normal	no record
21C	normal				normal	tortuous	normal	no record
22C	normal				normal	tortuous	normal	no record
Hebephrenic	Thos. No. 2	elevated			normal	tortuous	normal	no record
23C	Thos. No. 2-4	blurred		absent	normal	normal	scaphoid	has goitre
24C	normal	blurred		absent	normal	normal	normal	history of
Gen. Paresis?					normal	normal	scaphoid	Lues
25C	Thos. No. 2	blurred	tortuous	absent	normal	normal	scaphoid	tubercular
26C	Thos. No. 3	blurred	tortuous	absent	react	normal	scaphoid	negative
27C	Thos. No. 2	blurred	tortuous	absent	react	normal	scaphoid	no record
28C	Thos. No. 2	exudate	arterio-venous compression	absent	react	normal	normal	negative

TABLE III—MANIC DEPRESSIVE INSANITY.

Patient	Porus Opticus	Margins	Vessels of Fundus	Cribri-form Markings	Pupils	Conjunct Vessel	Scapula	Wasser-man	Urine
1D	absent	nasal		Thos. No. 3					
Depressed 2D	absent	marked	tortuous over fundus	Thos. No. 3					
Depressed 3D	absent	marked swollen	elevated exudate	distinct					
Paranoid 4D	normal	normal	normal	normal					
5D	absent	blurred		Thos. No. 2					
Manic 6D	flat	red	branch at surface	Thos. No. 3		tortuous			
Manic 7D	small	flannel	disappear in exudate			tortuous			
Manic 8D	present								
	absent	nasal		Thos. No. 3	normal				
9D	present	blurred		Thos. No. 3	normal				
	absent	blurred	tortuous too red						
10D	Thos. No. 2	blurred	arterio-venous compression	absent	react	tortuous	normal	negative	
	Thos. No. 4	exudate	wavy	marked		wavy		negative	
11D				absent	react	tortuous	normal	negative	
12D	post pap. atrophy	blurred	tortuous				scaphois	negative	
13D	shallow	exudate	dark exudate	absent	react	normal			
	Thos. No. 2		vessels tortuous	absent	react	tortuous		Albumen trace	
14D	Thos. No. 2	blurred		absent	arcus				
	Thos. No. 3	exudate		absent	react	normal	normal		
15D	shallow	blurred	beady exudate		to light			negative	

seventeen healthy university students chosen at random by Dr. Hall at the gymnasium of the University of Washington. One of these was presumably rachitic and should possibly be excluded from the table. He is included because he was a very bright and energetic student.

In closing, I wish to acknowledge my indebtedness to Dr. Keller and the other members of the staff at Fort Steilacoom and to Dr. Steiner and his staff at Salem; also Dr. D. C. Hall physical director University of Washington, for the very courteous assistance rendered me in this tedious work. I believe that such research should be undertaken by the state. If further research should prove what this study seems to make probable, namely, that dementia praecox and manic depressive insanity have as high a percentage of ophthalmoscopically visible pathologic appearances as general paresis and of the same sort, then it would seem the state and the taxpayer, to say nothing of the bereaved relatives of these victims of disease, should in self defense attack the problem of lessening the number of cases.

THE OPERATION OF TARSECTOMY.

DWIGHT C. ORCUTT, M. D.,*

CHICAGO.

Perhaps a word or two regarding the operation of tarsectomy may be of interest to some of you, for to me it has always been one of the most difficult operations about the eye to get a good result. The reasons for this are several, chiefly: 1—When the second fold of the inverted lid comes into view, one's anatomy is somewhat topsy turvy and the dissection of mucous membrane is likely to be improperly done the result of which is likely to be an entropion, also the bleeding is quite considerable throughout the operation.

But it is not the purpose of this paper to elaborate on the difficulties but rather to mention briefly the steps in making the operation comparatively easy.

General anaesthesia is preferable in most cases.

1. Evert lid and grasp the superior margin of tarsus with two firm fixation forceps. 2. Make incision along upper margin of tarsus extending to either canthus. 3. Merely start the dissection, and insert three double needled sutures, which the assistant holds throughout the dissection, making sufficient traction to keep the dissected mucous membrane tight.

It is probably well to dissect the center down first on account of the increased bleeding toward either canthus. Now for several years I have followed a technique somewhat similar but did not make dissection radical enough, the result has been more or less entropion. This I think is why the operation is in bad repute, therefore in making the dissection keep just to the mucous membrane and do not include any submucous tissue, and carry the dissection almost if not quite to the corneo-scleral margin, and toward either canthus, extend even a little farther downward to assure a free flap. 4. Now grasping the margin of tarsus dissect to the lid margin and cut leaving sufficient cartilage to make a firm margin. 5. Introduce double sutures, one through cilia, the other a little higher, and I believe by tying over a small roll of gauze it helps turn lid margin outward a little better. (I did this on the left eye of case presented but did not even tie on the right one), then carry sutures and fasten on brow with adhesive tape using sufficient tension to hold lid margin upward. Remove stitches in two days and leave bandage off.

*Presentation of case and read before the Illinois Charitable Eye and Ear Infirmary Club, April 14th, 1916.

There is little danger of ulcers, if leave bandages off in trachoma operations, at least this has been my experience. No after treatment has been necessary other than the usual routine.

I have not been satisfied with tarsectomies but have felt for several years that the results were superior to the Hotz in selected cases, and for at least two years I think each case has shown an improvement over the one previous, so to me the cardinal points are: Thin and free dissection combined with the proper fastening of the sutures, not forgetting the two fixation forceps should hold tight throughout the operation.

A lengthy article recently appeared in the *Annals of Ophthalmology* by Drs. White which is very similar, but as I have used most of the steps for two or three years, I feel perfectly free to mention them at this time.

This paper is intended to be filed as a report from the infirmary, and I wish to thank Drs. Dodd, Woodruff and Lane for cases on their services, also Dr. Roth for helping classify same.

RESULTS OF SALVARSAN IN OCULAR CONDITIONS.

DWIGHT C. ORCUTT, M. D.

CHICAGO.

Read before the Chicago Ophthalmological Society, April 17, 1916.

The question is so often asked regarding Salvarsan in ocular diseases, what class of cases it acts best—if it is of any use in other than specific cases, if so what kind? If there are any class of cases where its use is contra-indicated, etc., I have looked up our records at the Illinois Charitable Eye and Ear Infirmary, classified each case and report them in order.

The state began supplying us with Salvarsan and Neo-Salvarsan about July, 1914, and rather sparingly continued to do so until September, 1915, after that time have been unable to get any excepting a few doses of the American product recently.

In reporting these cases special effort will be made to give (1) Duration of disease (2) Wasserman reaction (3) Period in which treatment was pursued. Classification has been made in the following order (1) Optic atrophies (2) Ocular paralysis (3) Sympathetic ophthalmia (4) Interstitial keratitis (5) Neuro retinitis and Vitreous opacities.

The report is based upon our cases at the Infirmary only without any attempt at bibliography; however, a letter has been prepared and sent to several of the larger institutions asking for a similar report from each, same to be given briefly as a classification and summary.

Will consider very briefly the cases as follows:

1—Optic atrophies,

C. F. Male, aet. 32, miner.

Wasserman, neg. duration 10 months.

Vision R. 6/200 L. 10/200.

Treatment from May 29 to Aug. 1, '15.

Salvarsan (2).

Discharged improved vision R. 15/200 L. 20/100.

R. L. Male, aet. 31, foreman.

Wasserman, neg. duration 10 months.

Vision R. E. p. l. L. E. 2/200.

Neo Salvarsan (3), Salvarsan (2).

Treatment Dec. 4, '14, to Jan. 1, '16.

Discharged improved R. 5/200 L. 6/200.

C. B. Male aet. 56, laborer.

Wasserman ++ duration 2 years.

Vision R. p. l. L. nil.

Treatment from Aug. 23, '15, to Jan. 1, '16.

Neo Salvarsan (2).

Discharged slight improvement hand movement B. E.

W. D. Male aet. 43, laborer.

Vision R. 10/200 L. no p. l.

Wasserman ++ duration 18 months.

Treatment from Mar. 2, '15, to July 21, '15.

Salvarsan (1), Neo Salvarsan (5).

Discharged, no improvement.

J. R. P. Male aet. 42, motorman.

Wasserman neg. duration 15 months.

Vision R. E. 20/200 L. nil.

Treatment from Dec. 11, '14, to April 8, '15.

Neo Salvarsan (2), Salvarsan (1).

Reported later blind.

Summary Optic Atrophies,

Wasserman positive in two, negative in three.

Duration of all under two years.

Average time of treatment, six months.

Results—Marked improvement in two cases, light in one, no improvement in two.

It was noticeable in the cases that there was apparently a rapid improvement during the treatment, but later was retrogressive. This is probably psychic. Also notice that the negative cases showed the most improvement.

3rd—Nerve Paralysis.

C. P. aet. 35 Clerk.

Duration 8 months.

Very marked Ptosis R. lid and Diplopia.

Wasserman neg. Tuberculin.

Vision R. 20/50, L. 20/20.

Treatment Nov. 7th, '14, to May 22, '15.

Neo Salvarsan (4), Salvarsan (2).

Discharged absolutely cured 20/20 in either eye.

Sympathetic Ophthalmia.

S. S. Male aet. 6 years.

Left eye injured 6 months, irritation began in right eye two weeks before admission.

Vision R. 20/200, L. nil.

Enucleated left at once.

Treatment from Feb. 2, '14, to March 18, '14.

Neo Salvarsan (3) Discharged April 24, '14, Vision 20/200.

This patient has been seen at intervals and vision remained same.

F. W. Male, aet. 18, Clerk.

Wasserman Neg. Duration 2 mos.

Vision Feb. 2nd, '15, 2/200.

Treatment Feb. 2nd, '15, to July 17, '15.

Neo Salvarsan (5).

Salvarsan (1).

Discharged. Vision 20/20 right eye.

The details of this case are: Left eye cataract traumatic two years, lens removed July 20th, '14. No complications although extraction was difficult, the lens being soft and sticky. Discharged Aug. 10th, '14. Now comes the interesting part of his history. Two months later was struck in the operated eye by fist of a small brother, producing an intra ocular hemorrhage. He came back to hospital Jan. 31st, '15, a month after the injury. Left eye painful, soft, etc.; right eye usual findings of Irido Cyclitis and vision had gone from 20/20 when discharged to 10/200. Enucleation Feb. 2nd, '15, giving Neo Salvarsan the same day; Feb. 16th, Neo Salvarsan; to be brief, he received Neo Salvarsan, six injections from Feb. 2nd to July 14th, '15, and the vision gradually improved from 2/200 Feb. 2nd, to 20/20 when discharged July 17th, '15. Have seen patient several times and he is holding his own and working every day. There was so much interest in this case that

at times mercury and iodides were used, also a series of sweats, but from the vision improving as by magic the consensus of opinions was that without salvarsan the case would have been hopeless.

We may conclude from these two cases that the results from Salvarsan are flattering in sympathetic ophthalmies.

Interstitial Keratitis.

S. B. aet. 9.

Duration 2 months.

Vision B. E. hand movement.

Treatment, Neo Salvarsan (2).

Greatly improved; left hospital of own accord.

F. D. Male, aet. 21, laborer.

Wasserman +++ ; duration, one month.

Vision right, fing. 1 ft. L. 20/200.

Treatment June 12, '15, to Sept. 21, '15.

Neo Salvarsan (2).

Salvarsan (1).

Discharged R. 20/20, L. 20/30.

The details of this case are: Admitted June 12, '15. Right eye, hand movement, left 20/200. Wasserman positive +++. Was given injection of Salvarsan and two of Neo Salvarsan from June 26th to Sept. 3rd, '15. Unable to get more, he was discharged Sept. 21, '15; vision near normal in both eyes. This was one of the worst cases have ever seen, and to clear up in three months was much shorter period than we learned to expect under the usual treatment.

It is an accepted fact that while Interstitial Keratitis is to some degree a self limited disease, yet with the aid of Salvarsan its course is hastened at least one-half, and the symptoms greatly ameliorated. This statement is based upon the other cases and also the experience of others.

Neuro Retinitis and Vitreous Opacities.

I combine these two conditions for am satisfied that the latter never occurs as a distinct disease in itself, but is always associated with some other diseased condition.

I. H. Male, aet. 27, Blacksmith.

Duration, 4 months.

Wasserman ++.

Vision R. E. 6/200.

Treatment Feb. 11th, '15, to May 27th, '15.

Salvarsan (2).

Discharged V 20/20 both eyes.

Wm. B. aet. 53, Painter.

Duration, 3 weeks.

Wasserman +++++.

Vision, 20/50 both eyes.

Treatment Jan. 7th, '15, to Feb. 23rd, '15.

Salvarsan (1).

Discharged V 20/20 both eyes.

The same statement is true of Neuro Retinitis as in Interstitial Keratitis.

I now report a most interesting case of a young woman affected since July, '15, who made no improvement under the usual treatment until American product of Salvarsan was administered in Feb. '16.

Neuro Retinitis with Marked Vitreous Opacities.

F. K. Female. Trouble began last July. No etiology discoverable. Wasserman negative. Was treated in clinic for some time, with but little improvement.

Dec., '15, vision about 20/200.

Entered hospital Jan. 31, '16.

Vision at that time, R. 20/100, L. 20/80.

Vitreous very cloudy, especially the right; fundus not seen.

Patient given atrophine and dionin t. i. d.

Feb. 14, '16, vitreous had cleared, so that fundus could be seen and a neuro-retinitis was diagnosed.

Feb. 24, vision R. 20/80, L. 20/70.

Feb. 24, 6 gram. American Salvarsan was given. Considerable headache the first 24 hours.

Feb. 26, vision R. 20/60, L. 20/30-3.

Feb. 28, vision R. 20/50+3, L. 20/30+3.

March 2nd, vision R. 20/40, L. 20/20.

March 15th, 6 gram. Salvarsan given.

March 17th, vision R. 20/20, L. 20/20.

SUMMARY.

Optic Atrophy (5)—Improved (3), No results (2).

Neuro Retinitis (2)—Absolute improvement.

Interst. Keratitis (2)—Improved (2).

Paralysis of third nerve (1)—Absolute improvement.

Sympathetic Ophthalmia—Improved; practically hopeless without Salvarsan.

A word regarding the reaction: The better results have been obtained in those cases that the injection was followed by a marked ciliary redness without pain. I have noticed the reaction in cases with a negative as well as positive Wasserman, true that a negative is not proof positive that specific disease does not exist. Therefore, taking the view of the presence of spirochetes, it is fair to suppose that the reaction is due to a stirring up of the spirochetes to renewed activity.

Both cases I show tonight demonstrate this to perfection, one being Interstitial Keratitis and of course a positive findings, the other with vitreous opacities and swollen disc has every symptom of late specific condition, but with a persistent negative Wasserman.

KERATITIS NEUROPARALYTICA RESULTING FROM
ALCOHOL INJECTIONS FOR FACIAL NEURALGIA,
WITH REPORT OF A CASE.

ED. E. MAXEY, M. D. O

BOISE.

Early in the year 1913 the patient, a man at that time 44 years old, had a growth removed from his lower lip. Nothing is known concerning the nature of this growth or of the method of removal other than that the "doctor" whom he consulted called the growth a "cancer" and that he used a paste-like medicine to "burn it out." The lip healed promptly, but about the time the lip was healed he began to notice neuralgic pains in left lower jaw, radiating to region of left ear, and shortly after the pains began he noticed a shot-like, tender nodule at region of mental foramina.

The neuralgic pains increased in frequency, and length and severity of attacks. He was treated by several competent physicians, without results, and in February, 1914, he submitted to a resection of the mental nerve at the foramina.

This gave entire relief for some time, but within two months the pains began to return, and soon they were worse than before the resection operation because they now involved practically all of the area supplied by the inferior maxillary division of the fifth nerve, and a few months later the superior maxillary division was extensively involved.

During the summer of 1915 he visited a well known clinic in the Middle West, where he was given eight alcohol injections, at a few days' or weeks' intervals, and he came home about free of pain. But about the time he returned in late summer he began again to have severe pains and noticed anesthesia and paralysis of left side of face, including eyeball and lids.

He consulted me first on the 7th of October, 1915, when he came for treatment of eye condition. Examination showed complete paralysis and anesthesia of entire area supplied by second and third divisions of left trifacial nerve. As a result of paralysis and anesthesia there was marked lagophthalmus, ectropion of lower lid, the entire conjunctiva was congested and inflamed, with slight mucopurulent discharge, no lachrimation, the cornea was almost covered with a suppurating ulcer, the aqueous was turbid, and a small hypopyon had formed in lower angle of anterior chamber. The neuralgic pain was very severe at this time and seemed to center

*Read at annual meeting of Pacific Coast Ots-Ophthalmological Society, Portland, Oregon, June 22-23-24, 1916.

deep behind the eye. Smears from the corneal ulcer demonstrated the presence of various organisms, mostly staphylococci, pneumococci, and streptococci.

Treatment seemed to have no effect whatever in staying the progress of the corneal ulceration. The ulcer was curetted, cauterized with trichloroacetic acid, and the eye filled with an antiseptic ointment. The lids were bandaged closed. The patient lived in a neighboring town and was not able to remain for me to follow up the treatment, so he returned home where his family physician carried out my directions as to treatment. But in spite of all that was done, the cornea continued to suppurate and slough until perforation occurred, following which the suppurative process extended to the uveal tract and vitreous, and when he returned to me on the first of December the condition of panophthalmitis was so extensive that I deemed it advisable to enucleate the eye, which I did on the following day.

His pain continued, becoming more and more severe and unbearable and more centrally located, but after his return home a week or ten days after enucleation of eye he was able to attend to his duties as Probate Judge and continued to do so for over two months. But he was getting weaker and weaker and in March had to give up his work entirely, after which he failed rapidly and died on or about the 20th of April. I did not see him for some weeks prior to his death, but the inferred cause of death was extension of the neuritis or pathological condition which had caused the neuralgia, involving the central nervous system.

The points of particular interest in this case seem to be: (1) Cause of the trifacial neuralgia; (2) relation of neuralgia to the eye condition, and (3) the alcohol injections as a factor in producing the eye lesion.

The causes of trigeminal neuralgia are so varied and so little understood that we are quite often unable to trace the neuralgia to any particular causal factor. In this case, however, the beginning of the neuralgia can be definitely traced to the removal of a suspicious growth from the lower lip, with arsenical paste, but we are unable to say whether the growth, the arsenical paste, or a coexisting pyorrhoea of inferior incisors, was the direct cause of the neuralgia. The history inclines me to the belief that the arsenical paste, through its extremely irritating effects, was the chief causal factor.

I was in doubt whether to classify this case as one of keratitis neuro paralytica or keratitis e lagophthalmos. It might be either

or both, judging by the conditions as known to me. As I did not have an opportunity to observe the case before infection of the cornea had occurred it is not possible to say just what the initial corneal lesion was, nor just what portion of the cornea was first involved. It is no doubt probable, however, that the lagophthalmos caused an early dessication of the exposed cornea, which in turn became infected, resulting in the destruction of cornea found at first examination. But it is impossible to say whether or not the initial lesion was entirely due to involvement of trophic nerve fibres supplying the cornea.

There is no question but what the alcohol injections caused the paralysis and anesthesia which developed in this case. In the abstract of this paper I think I said the injections were made into the Gasserian ganglion. If so, the statement is an error, for in looking up my notes I find that all of the eight injections were made into the side of the face at the points selected for reaching the second and third branches of the fifth nerve. It is not known which of these divisions was injected last, but the inference would be that the second or middle division of the fifth nerve was injected last, and that in their effort to reach the nerve at the foramen rotundum, some of the alcohol entered the orbit, producing the subsequent train of eye lesions. Concerning the permanent paralysis and anesthesia, it was as complete as it would have been had the nerve been resected, so evidently the repeated injections destroyed both the sensory and motor fibres of the second and third divisions of the trifacial nerve. The first division, or ophthalmic branch, probably was not injured.

BONY TUMOR OF THE VITREOUS CHAMBER SPRING- ING FROM THE CILIARY BODY.

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The case which I report is one, I believe, of interest to all of us. The history is the following:

J. Fuller, aged 18 years and 4 months; only child; family history so far as could be determined is good. No evidence of eye disease in either parents or parents' families. No trace of tubercular trouble with patient or families. Aside from the eye difficulty, the patient seems perfectly normal in every way. Except measles, there has been no physical illness during her entire life. Her birth was normal (no instrumental delivery), and at birth the child in every way seemed physically normal. At four months of age the right eye became very red and inflamed, causing great suffering. The attack of inflammation lasted for two months, during which time she was under the care and treatment of a competent ophthalmologist, who pronounced the case glioma of the retina, and advised the removal of the eye. The inflammation, however, slowly subsided and the eye assumed a state of quiet, but the pupil remained widely dilated and fixed, with a distinct yellow reflex. This dilatation remained a permanent feature of the eye. (The mother thinks the eye was blind after the first attack, but previous to that time had noticed nothing to attract attention to the eye.)

Three months later the patient suffered a second attack of inflammation similar in its manifestations to the first, though shorter in duration. Glioma was again diagnosed and enucleation advised. The diagnosis was concurred in by a consultant at this time.

Following this seizure the eye assumed a slightly staring appearance. No further difficulty was experienced until at five years of age, when she suffered another attack of inflammation. This was the most severe of all, and the ophthalmologist in attendance again advised enucleation to avoid, as he stated, rupture of the eyeball. I might add that there is no evidence at hand of irritation or disturbance of the left eye at any time. Aside from an occasional redness of the right eye, with little suffering, lasting but for a few days at a time, no further disturbance was experienced until three weeks previous to the time she consulted me, on August 15, 1915. At that time the following conditions were present:

Left eye: Vision, 20/20; normal in every way. Right eye: Light perception only, and in a state of general inflammation. This condition, she stated, had existed for three weeks. The cornea was slightly steamy in appearance, with bulging at the nasal side and noticeably thinner. Springing immediately from the limbus, at the point of greatest bulging, there existed a wedge-shaped abrasion of the cornea, at its base four millimeters in width. This extended directly across the center of the cornea to the limbus on the temple side. Above and below the apex of this abraded area, an imperfect view of the eye chambers could be had. The pericorneal injection was deep, indicating a marked ciliary inflammation chamber deepened and iris out of sight. Aqueous and lens slightly turbid. Although the media could be imperfectly viewed, yet the yellow reflex from the posterior chamber could be quite distinctly seen. The motion of the eyeball was entirely unimpaired, but the upper lid edematous and drooping. The suffering to the patient was excruciating. The history of the case and its present physical findings suggested but one course to follow, namely, enucleation, which I did under a general anesthetic on September 9, 1915. I might say that when under the anesthetic a hard tumor could be distinctly felt within the eye chamber, apparently smooth in its outline. The eye, after enucleation, presented nothing of particular interest. There were no adhesions to the orbital contents or marks of cicatricial contraction in the sclera, as we might expect after a traumatism. The eyeball was given to the Columbus Laboratory for examination, and I can not do better than to submit the laboratory report as furnished.

REPORT: "Specimen of an enucleated eye. About normal in size and has been entirely preserved. There is a cloudiness of the cornea. The sclera free from bulging or defects. On palpation, one can feel a hard mass in the posterior wall, or in the vitreous. At one point a rounded edge can be made out, while at other points it is smooth. After hardening and making a section through the eye, a grayish hard mass is seen in the posterior chamber, attached or springing from the ciliary body. There is soft tissue with masses of hard, gritty structure. The specimen was decalcified and a very good section obtained. The microscopic examination shows nothing of interest in the anterior segment of the globe, nor in the sclera. The mass seen microscopically is found to arise from a ciliary base. There is some displaced retinal tissue to one side of the growth. Histologically, there is a mass of mature fibrous tissue holding spiculae of bone. One of these bone masses is of relatively large

size. There are collections of round cells along the blood vessels, but no degenerative areas. Otherwise, the tissue is quite acellular. There is entire absence of the cellular structure as found in glioma. We do not consider it a malignant growth. Our opinion is that we have here a form of colyboma with a fetal inclusion of bone tissue. The condition is certainly not the remains of a tubercular infection.

"Signed, A. GEHRMANN."

I submit also for your inspection a very accurate drawing, made immediately after section of the ball. This shows the relative position of the various parts of the eye, but especially the ciliary body at the point of origin of the tumor, with the noticeable hypertrophy and apparent cleft or break in continuity posterior to the ciliary process.



I also hand you a mounted specimen of one-half of the eyeball. The section of the ball was horizontal and practically in the center of the cornea. The portion shown is the upper half, so that which would appear to be the temple side is really the nasal. You will observe that the lens is absent, having been mutilated in section. Here, likewise, can be seen the change in the ciliary body, its interruption posteriorly, and the place of attachment of the tumor. The bone mass, as you will see, is here well shown. It measures ten millimeters in its transverse diameter and four millimeters anteroposteriorly. If you will illuminate this specimen well, you will see a second, quite distinct, bone mass entirely within the ciliary body proper. This measures three by one millimeter, and structurally differs in no way from the larger tumor. I offer the suggestion

that a recent development of this small bone mass within the ciliary body might serve to explain the last inflammatory attack suffered by the patient, wherein such marked signs of cyclitis with bulging over this immediate point existed, as set forth in the history already given. It should, in this connection, be recalled that more than twelve years had elapsed from the time of a severe attack of inflammation up to the time of the last attack, which is quite in keeping with the usual course in bone formation, as we generally recognize in this process very slow changes.

The microscopical mounting here shown is a transverse section taken from the under half of the eyeball, and therefore shows the attachment of the tumor to the ciliary body on the nasal side as it actually existed. The bulging at the limbus immediately over the small bone mass in the ciliary body is here better shown, and conveys a better idea of the appearance of the eye before enucleation.

I report this case in detail with laboratory findings, drawings, mountings, and so forth, because it would seem to present several features of interest. I attach no particular importance to the early and frequent diagnosis of glioma. That would seem to be almost the logical diagnosis in tumors of the vitreous chamber of the new bone. In passing, it is well, however, to call attention to the possible confusion as is here shown on this point.

The presence of a bone tumor within the eye chamber, as we know, is not uncommon, yet, after a careful search of ophthalmic literature over the past sixteen years, I am unable to discover the report of a case of a distinct bone tumor of the ciliary body. Numerous reports can be found of degenerative changes of the ball, with ultimate bony formation, in which the ciliary body may share, but in nearly all such cases injury with panophthalmitis preceded the ultimate bone formation. The history of this case furnishes no such premises to reason from. We have here a process of bone formation, confining itself entirely to the ciliary process, with the eyeball but slightly altered, and this, too, eighteen years after the primary inflammatory seizure, at which time we have positive evidence that a tumor existed. We naturally inquire the cause, likewise when did this change begin? The clinical history of the case, with the later findings, would seem to confirm the opinion of Dr. Gehrmann: "That it is *foetal* in origin." The embryonic cells, for some unknown reason, being submitted to irritation, were stimulated to growth and the formation of fibrous tissue, and this, later, into bone. This process, however, must have been well advanced at birth to furnish an explanation of the presence of a tumor and the

severe inflammatory attack in this eyeball at only four months of age.

In conclusion, I beg to call your attention to three points of interest in this case:

First: Its quite evident foetal origin.

Second: The confusion which may arise in diagnosis of tumors of the new-born eye.

Third: That the entire bone formation would seem to have confined itself to the ciliary body.

STATE LEGISLATION CONCERNING SHOP LIGHTING, SHOP ACCIDENTS, SHOP CONDITIONS, THE COMMON TOWEL, ETC.

PAPER NUMBER FIVE.

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The article on shop (etc.) conditions affecting the eyes, as regulated by law, is the poorest outlined of any of the articles of this series, and therefore the most difficult to write. The boundaries of a paper on "Trachoma," "Wood Alcohol," etc., are clearly defined, but there seems to be no well circumscribed limit to the present paper; it might be of almost any length. There are many laws containing no reference whatever to eyes, and yet having (amongst other things) a direct bearing upon these organs, laws regulating belt shifting, lead poisoning, rubber vulcanizing, etc., etc., usually do not mention eyesight at all, and yet vision is at stake in all of them. Very likely eyesight was not even thought of when many of these laws were written, and yet they have an important bearing upon this interesting subject. It will be necessary, therefore, to copy laws bearing upon eyesight, in which eyesight is not mentioned, and it is to be hoped that the reader will not feel that space and time have thereby been unnecessarily wasted.

It should be said in the first place that the eyesight of many workmen is imperiled by the manufacture of wood alcohol—but this is a subject that has been fully discussed in Paper Number Four of this series, and it is therefore not necessary to dwell upon it in this article.

One of the most interesting phases of shop conditions affecting eyes, is the advantages and disadvantages of good and poor lighting. Diseased ocular conditions can undoubtedly be produced by insufficient, excessive or poorly directed illumination. Of course, the first of these is the usual defect, but nevertheless, many shops have excessive and irritating illumination, and many lights are so arranged that they are a positive menace to ocular safety. It is unnecessary to go largely into the subject of shop lighting, etc., because there are now available for all architects and shop owners educated illuminating engineers, who are thoroughly competent to assume the entire burden, and solve it in the best and most scientific manner possible. It is poor economy not to employ such men, for entirely aside from the question of ocular hygiene, it is

unquestionably profitable to properly illuminate working areas. Shops, etc., should be so constructed that daylight (the best of all illuminants) shall be utilized to the best possible advantage, and when artificial illumination is used it should simulate daylight as nearly as possible. Illumination should be ample, but not excessive; it should be evenly diffused and should not fall directly in the eyes; it should come from above, behind and from the left. It should not throw shadows on the work. Bad lighting causes eye-strain and ocular fatigue. Bad lighting causes the workmen to give close and constant attention to the details of his work. Therefore, work which should be accomplished automatically, is only performed by great effort, thus lessening the ordinary output. Besides this, mistakes are likely to occur under this kind of ocular and mental pressure, which means much spoiled material and more liability to accidents. It has been estimated that more than 25 per cent. of shop accidents are due to poor illumination, and it has also been shown that shop accidents are at their minimum during the light days of July and August, and that they increase as the days grow longer and darker. It has been estimated that the proper lighting of steel mills will increase their output 2 per cent. and of textile and shoe factories 10 per cent. The cost of proper shop lighting only costs from one-tenth to one-half of one per cent. of the wages. Thus, if a man earns \$3.00 per day, it would cost about one cent and a half a day to furnish him with adequate illumination. Illuminating engineers are quite united in recommending the tungsten lamp as the best lamp for general use on the market. It gives a good light, closely simulating daylight, and is cheap and durable, the life of a lamp ranging all the way from 1000 to 2000 hours. The efficiency of these lamps can be much enhanced by backing them with bowl shaped white porcelain enameled reflectors. Lamps and reflectors are more efficient if they are kept clean. White walls and woodwork, and clean windows will also add about 20 per cent. to the efficiency of natural and artificial illumination. The conclusion is, therefore, that proper lighting of shops, etc., preserves eyesight, improves the efficiency of labor, increases the manufactured output, and therefore the profits; is economical and cheap and decreases accidents. There are, therefore, no possible objections to its use, and proper, natural and artificial illumination of shops, etc., should be required by law. Another cheap and efficient method of avoiding accidents in shops and of increasing the working efficiency, is the wearing of suitable goggles while working at certain avocations, such as the use of emery wheels, revolving saws, chipping, hammering, etc. It

should never be forgotten that eyesight is one of the most important requisites to good work and that anything that conserves vision is profitable to both employer and employe. In fact, all kinds of safety devices in shops increase the efficiency of labor, and this means more and better work, and consequently more profit to the owner. This is entirely aside from the benefit to the men who escape injury, and from the added cost to the owner in caring for the injured men, paying for litigation and paying for verdicts against the owner. It may, perhaps, best be stated here that the Pullman Company have estimated that 35 per cent. of all shop injuries are eye injuries. It is, of course, not always easy to get men to wear goggles, even when they are freely furnished to them without cost. Some men seem to think it is cowardly to wear them, others do not want to be bothered, others think they interfere with their work, and others do not wear them from dense ignorance and sheer doggedness. Nevertheless, goggles are being worn more and more, as men become increasingly intelligent as to their usefulness and see frequent physical demonstrations of ocular salvation through goggles. Many laborers are densely ignorant foreigners, who should be constantly educated concerning the great utility of such protectives. Goggles are cheap and employers can amply afford to furnish them free of cost to their help. They should, moreover, be required to do this by law. Most factories are glad to do this, and they are being used more and more as time progresses. There are many different kinds of goggles on the market, and some of them are open to serious objections. Mica, for instance, is not clear nor strong enough. Besides this it scratches easily and becomes opaque when struck. Celluloid has most of the objections of mica, and in addition it burns and explodes easily. Wire gauze cuts off from 15 to 35 per cent. of the illumination, is confusing and diminishes vision. If the mesh is dark, light is absorbed, and if white, gilt or nickel gauze is used, the mesh causes annoying reflections. If glass in combination with gelatine or celluloid is used, distant objects are distorted, and the imperfections in the glass cannot be eliminated. Ordinary brittle glass is dangerous, and eyes are sometimes injured and lost from splintered fragments. Opticians now make very tough, thick and clear glass for goggles, and this is the best material we know of at the present time. This kind of glass is made to withstand blows, and one kind has been tested as follows. A hardened steel ball $\frac{5}{8}$ inch in diameter, was dropped from a height of 21 inches on the unsupported glass, 35 times without breaking it. Glass goggles of this kind have saved many eyes

from injury, and should be worn by all workmen, needing such protection. The glass can be ground to correct the man's refraction, and can be sterilized, as no velvet or soft material is used in their construction. The glasses should be large, and should have wire screens at the sides. They can be worn with comfort. In the American Steel Foundries shops, eye accidents were reduced 75 per cent. in two years, by wearing such protectives. It is interesting to learn the kind of eye accidents produced in one steel mill out of 275 cases of injury. The following table will show the result of the investigation:

Hammering	101	Emery wheels	56
Molten metal	47	Electric flash	27
Rivetting	16	Machine tools	16
Bursting of water and lubricating glasses	7	Belting	5

Such accidents can be very much reduced by wearing goggles, and by taking other evident precautions. Most hammering accidents are caused by using tools with burred or mushroomed edges. Workmen should keep their tools in good condition. Emery wheel accidents can be much reduced by using hoods on the machines. Glass or leather guards should be used, and the exhaust system by which dust particles, etc., are sucked away should be employed. It is interesting and shocking to carefully examine the cornea of a workman who has operated an emery wheel for a long time. The cornea will almost always be found speckled with little scars from emery dust injuries, received from time to time. Vision is, of course, correspondingly diminished. If a workman wears glasses or goggles while at work, the lenses will be found well scratched by flying emery particles. Molten metal accidents can be reduced by exercising great care in handling the metal, and by having protectives around the vat. Of course, goggles should be used in all these trades. Electric flashes can be avoided by using enclosed switches and fuse boxes. Bare fuses, switches, terminals, etc., are dangerous on account of electric shock, which may occur through accidental contact with them, as well as from their liability to cause injuries. Injuries from rivetting can best be avoided by care and the use of goggles. In working with machine tools, such as milling machines, shapers, etc., a chip guard should be used. This is a small frame containing a piece of plate glass, and is of great assistance in preventing pieces of metal from flying into the eyes. Water and lubricating glass accidents, can be reduced by using the best glass, and by protecting the glass with

suitable guards, as the contents are under constant and strong steam pressure. Belting accidents from broken belts are usually caused by the use of hooks, lacings, etc., in making a joint, which does not develop the full strength of the belt. Under these conditions the belt is only as strong as its weakest part, and an accident is exceedingly liable to occur. Endless or glued joint belts should be used. Many accidents occur by replacing a belt on a pulley by means of a stick. This is very dangerous and should only be done by experienced men, in emergency cases. Excessive light or heat in shops, such as steel shops, where electric steel welding, etc., is done produces retinal and other eye injuries. The temperature in these furnaces is extremely high and the light correspondingly brilliant. In cast iron furnaces a temperature of about 2,000° F. while in electric welding the heat rises to 12,000° F. It can be readily believed that heat and glare of such intensity can produce retinal and optic nerve injuries and burns of the skin, conjunctiva and cornea. Workmen under these conditions should look at the fire through a screen of blue and red glass, as these colors are best adopted for the purpose. While the glass mitigates the heat in doing electric welding, the worker should also use an aluminum helmet. Retinal conditions produced from grinding carbon or manganese steel where the worker looks constantly into a steady stream of sparks, can best be combated by wearing amber goggles. Before leaving the subject of working under great heat and glare, the fact that glass blowers are apt to develop cataract must not be forgotten. This danger can be much lessened by the wearing of amber or blue goggles. Burnishers of silver, etc., where the eyes look long and steadily upon a highly polished surface, are frequently afflicted with abnormal retinal conditions, which could be obviated by using amber goggles.

Perhaps this will be as good a place as any to protest against the time honored institution known as the "Shop Oculist," and to advocate that he be deprived from following his highly dangerous occupation, by due process of law. In almost all shops, there will be found a man who acquires the reputation of being skillful at removing foreign bodies from the eyes of his fellow workmen. He is called the "Shop Oculist," and works with dirty tools and dirty hands, with no pretense of asepsis. He is frequently successful in his efforts, but from time to time, eyes are injured or lost, through this highly improper and injurious method of handling, what are apparently trifling injuries. Such practices should be prohibited by law. Workmen and doctors should never

regard eye injuries as trivial. Many eyes are annually injured or lost, by a disregard of this principle, as the eye is most sensitive to damage and infection, and a slight injury, that ulcerates, and scars, may reduce vision to a very low degree; or the eye may become more and more infected until its removal becomes necessary. Respect "slight" ocular injuries, and much eyesight, misery, and money will be saved. Even general surgeons are not always competent to care for ocular injuries, and as a general proposition it may be stated, that it would be much better for all concerned, if *all* eye injuries, no matter how slight in character they may be, were sent *at once* to a competent eye surgeon. I desire also to advocate the usefulness and economy both to employer and employe, of a careful examination of all employes' eyes before they are employed. The better the eye, the better the work, and if employes need glasses or treatment, in order to improve their vision, to a good working standard, it will pay all parties concerned to see that this is done. Another very useful purpose to be accomplished by this systematically examining the eyes of all employes, would be, that the visual acuity of employes would be known, when they first go to work. Injured men often assert, that their eyes have been damaged during service, and that before some accident happened, their vision was perfect, but that after the accident, the vision of one or both eyes, become very much diminished. If the records could show the visual condition upon applying for work, many suits for damage, could be immediately stopped or settled upon fair and intelligent grounds. Great attention should be given to those occupations in which poisons enter the body and injure vision by inhalation, etc. Amongst these may be mentioned di-nitro benzene which is used in mining and in manufacturing aniline dyes. Its ill effects can be prevented by ventilation, and by using closed mixing vessels in its preparation. Bisulphide of carbon used in vulcanizing rubber produces a vapor which injures sight. Nicotine may be absorbed in tobacco factories, and arsenic in paper hangers and painters. Many eyes are injured in the various trades where lead is employed—such as plumbers, painters, etc. Ventilation, cleanliness and other precautions, will do much to minimize the danger. The use of high explosives in mining, railroad construction, etc., should be restricted by law. Bursting bottles in charged water factories, and lime burns in masons, bricklayers, plasterers, etc., often produce eye injuries. Miners should be protected from injuring their eyes, in the prosecution of their labor. Not only may their eyes be

injured by explosions, etc., but poor vision, nystagmus, etc., may be produced by working under ground, by poor light, looking upwards, and working while lying on their backs. The list of occupations hazardous to eyesight, might be greatly extended, but enough has been said to show, that vision may be injured in almost all occupations, that great precaution should be taken to protect this important organ, and that wherever legal protection is possible, it should be taken, and that laws thus enacted should be observed, or punishment exacted by those officials, whose duty it is, to see that laws are not broken.

The shop laws of the various states having a direct or indirect bearing upon eyesight, will now be given. It will be observed that no mention of vision is made in many of these laws, such as the laws concerning lead poisoning, belt shifting, emery dust, etc., and yet such laws have a direct bearing upon eyesight, and must be mentioned in a paper of this character.

DISTRICT OF COLUMBIA.

Law of Commissioners.

1897.

3. That no person, being the owner, proprietor, lessee, manager, or superintendent of any store, factory, workshop, or other structure or place of employment where workmen or workwomen are employed for wages, shall cause, permit, or allow the same, or any portion or apartment thereof, or any room therein, to be over-crowded, or inadequate, faulty, or insufficient in respect of lighting, heating or ventilation.

Law of Commissioners.

1916.

Sec. 1. No person shall provide or expose any towel or similar article for use by the public generally in any place under his control, or allow any towel or similar article to be so provided, exposed, or used there, unless such towel has been thoroughly cleansed since last used.

Sec. 2. Any person who violates any of the provisions of this regulation shall, on conviction thereof, be punished by a fine not exceeding twenty-five dollars.

Sec. 3. This regulation shall take effect on and after February first, nineteen hundred and sixteen.

Sec. 1. No person shall provide or expose for common use, or permit to be provided or exposed for common use, in any hotel, restaurant, lunch room, store, shop, school, office building, place of amusement, or any similar establishment, any article named below, unless it has been thoroughly cleansed since last used; that is to say, any cup, mug, glass, fork, spoon, finger bowl, jar, spirometer, mouthpiece, napkin, towel or similar article.

CONNECTICUT.

State Board of Health.

Publication of 1902.

Sec. 4516. Sanitary condition of factories. All factories and buildings where machinery is used shall be well lighted, ventilated, and kept as clean as the nature of the business will permit. The belting, shafting, gearing, machinery, and drums, of all factories and buildings where machinery is used, when so placed as, in the opinion of the inspector, to be dangerous to the persons employed therein while engaged in their ordinary duties, shall, as far as practicable, be securely guarded. No machinery other than steam engines in a factory shall be cleaned while running after notice forbidding the same is given by the inspector to the owners or operators of the factory.

Sec. 4522. Penalty for violation of orders. Every owner, lessee, or occupant of a factory or building included within the provisions of this chapter, or owning or controlling the use of any room in such building, shall, for the violation of any provision of Sec. 4516, or for obstructing or hindering the inspector of factories in carrying out the duties of his office, be fined not more than fifty dollars but no prosecution shall be brought for any such violation until four weeks after notice has been given by the inspector to such owner, lessee, or occupant of any changes necessary to be made to comply with the provisions of said sections, and not then, if, in the meantime, such changes have been made in accordance with such notification. Nothing herein shall limit the right of a person injured to bring an action to recover damages.

Sec. 4529. Sanitary condition of workrooms. The person operating said workrooms shall keep the same at all times in a clean and sanitary condition, properly lighted, ventilated, and fit for the occupancy of the persons engaged in work therein. The inspector or any of his special agents shall notify the owner of such premises, and the person using the same for the purposes set forth in Sec. 4527 to provide ample means for lighting or ventilating such workrooms, and to put the same in a clean, sanitary, and fit condition for occupancy for said work; and if said notification be not complied with in thirty days after the service of such notice, said inspector or any of his special agents shall cause complaint to be made to the proper prosecuting authority.

Use of Stained Glass Windows Forbidden: Every person, firm or corporation, using stained, painted or corrugated glass in factory windows, where the same is injurious to the eyes of the workmen therein, shall remove the same upon the order of the factory inspector.—Gen. Statutes 1902, Sec. 4518.

CONNECTICUT.

Legislature.

1913.

Removal of Excessive Dust: Sec. 1. Every employer whose business requires the operation or use of any emery, tripoli, rouge, corundum, stone, carborundum, or other abrasive, polishing, or buffing wheel, in the manufacture of articles of metal or iridium, or whose

business includes any process which generates an excessive amount of dust, shall install and maintain in connection therewith such devices as may be considered necessary by the factory inspector and state board of health to remove from the atmosphere any dust created by such process. The factory inspector, with the state board of health, shall issue to any employer engaged in such business any orders necessary to render effective the foregoing provision, and if within sixty days from the issuance of such order stating the changes to be made, such order shall not be complied with, the factory inspector may order such department closed until such order is complied with.

Sec. 2. The violation of any provision of the foregoing section or the failure to comply with any written order issued in accordance therewith within sixty days thereafter shall constitute a misdemeanor punishable by a fine of not more than five hundred dollars for each offense, and every such order shall be enforceable by the superior court or by a judge thereof if said court is not in session, by injunction on application of the factory inspector or of the state board of health.—Public Acts 1913, Chap. 208.

KANSAS.

Legislature.

1909.

Sec. 8019. The commissioner, as state factory inspector [or deputy state factory inspector], shall have power to enter any factory or mill, workshop, private works or state institutions which have shops or factories, when the same are open or in operation, for the purpose of gathering facts and statistics such as are contemplated by this act, and to examine into the methods of protection from danger to employes and the sanitary conditions in and around such buildings and places, and to make a record thereof of such inspection. If the commissioner as state factory inspector [or deputy state factory inspector] shall find upon such inspection that the heating, lighting, ventilation or sanitary arrangement of any workshops or factories is such as to be injurious to the health of the persons employed or residing therein, or that the means of egress in case of fire or other disaster are not sufficient, or that the belting, shafting, gearing, elevators, drums, saws, cogs and machinery in such workshops and factories are located or are in a condition so as to be dangerous to employes, and not sufficiently guarded, or that vats, pans, or any other structures, filled with molten metal or hot liquid, are not surrounded with proper safeguards for preventing accidents or injury to those employed at or near them, he shall notify, in writing, the owner, proprietor or agent of such workshops or factories to make, within thirty days, the alterations or additions by him deemed necessary for the safety and protection of the employees; and if such alterations or additions are not made within thirty days from the date of such written notice, or within such time as said alterations or additions can be made with proper diligence upon the part of such proprietors, owners, or agents, said proprietors, owner, or agents so notified shall be deemed guilty of a misdemeanor, and upon complaint of the commissioner as state factory inspector before a court

of competent jurisdiction, and upon conviction thereof, shall be fined in a sum not less than \$25 nor more than \$200, or by imprisonment not more than ninety days, or by both such fine and imprisonment.

RHODE ISLAND.

Legislature.

1910.

Sec. 9. If the factory inspectors, or either one of them, find that the heating, lighting, ventilation, or sanitary arrangement of any shop or factory is such as to be injurious to the health of the persons employed therein, or that the means of egress in case of fire or other disaster is not sufficient or in accordance with all the requirements of law, or that the belting, shafting, gearing, elevators, drums, and machinery in shops and factories are located so as to be dangerous to employes, and not sufficiently guarded, or that the vats, pans, or structures filled with molten metal or hot liquid are not surrounded with proper safeguards for preventing accident or injury to those employed at or near them, either or both shall notify the proprietor of such factory or workshop to make the alterations or additions necessary within ninety days; and if such alterations or additions are not made within ninety days from the day of such notice, or within such time as such alterations can be made with proper diligence upon the part of said proprietors, said proprietors or agents shall be deemed guilty of violating the provisions of this chapter, subject, however, to the right of appeal as hereinafter provided.

COLORADO.

Legislature.

1911.

Safety Appliances: Sec. 2. That any person, firm, corporation or association operating a factory, mill, workshop, bakery, laundry, store, hotel or any kind of an establishment wherein laborers are employed, or machinery used shall provide and maintain in use belt shifters or other mechanical contrivance for the purpose of throwing on or off belts or pulleys while running, where the same are practicable with due regard to the nature and purpose of said belts and the dangers to employes therefrom; also reasonable safeguards for all vats, pans, trimmers cut-offs, gang edger and other saws, planers, cogs, gearings, beltings, shaftings, couplings, set screws, line rollers, conveyors, manglers in laundries, and machinery of other or similar description, which it is practicable to guard, and which can be effectively guarded with due regard to the ordinary use of such machinery and appliances, and the dangers to employes therefrom, and with which the employes of any such factory, mill, or workshop are liable to come in contact while in the performance of their duties; and if any machinery, or any part thereof, is in a defective condition, and its operation would be extra hazardous because of such defect, or if any machinery is not safeguarded as provided in this act, the use thereof is prohibited, and a notice to that effect shall be attached thereto by the employer immediately upon receiving notice of such defect or lack of safeguard, and such notice shall not be removed until said

defect has been remedied or the machine safeguarded as herein provided.

Legislature.

1915.

Compensation for the loss of an eye.

The loss of an eye by enucleation, 139 weeks.

Total blindness of one eye, 104 weeks.

The loss of both hands or both arms, or both feet or both legs, or both eyes, or of any two thereof, shall prima facie constitute total and permanent disability, to be compensated according to the provisions of this section. Provided, that, where the disability comes under this section, and where the employer or the Commission obtains other suitable employment for such disabled person which he can perform and which in all cases shall be subject to the approval of the Commission, the disabilities set out in this paragraph shall not constitute permanent total disability, but such partial disability as may be determined by the Commission after a finding of the facts.

Sec. 13. Any person who shaves another person afflicted with syphilis, eczema, blood poison, or any skin disease, who does not, before he or she again uses their tools and towels, subject them to disinfection, by boiling, shall be guilty of a misdemeanor, and shall be punished accordingly.

OREGON.

Legislature.

1911.

Section 5040. That any person, firm, corporation or association operating a factory, mill or workshop where machinery is used, shall provide and maintain in use belt-shifters or other mechanical contrivances for the purpose of throwing on or off belts or pulleys while running, where the same are practicable, with due regard to the nature and purpose of said belts and the dangers to employes therefrom; also reasonable safeguards for all vats, pans, trimmers, cut-off, gang edger, and other saws, planers, cogs, gearing, belting, shafting, coupling, set screw, live rollers, conveyors, mangles in laundries, and machinery of other or similar descriptions, which it is practicable to guard, and which can be effectively guarded with due regard to the ordinary use of such machinery and appliances, and the dangers to employes therefrom, and with which the employes of any such factory, mill or workshop are liable to come in contact while in the performance of their duties; and if any machine, or any part thereof, is in a defective condition and its operation would be extra hazardous because of such defect, or if any machine is not safeguarded as provided in this act, the use thereof is prohibited, and a notice to that effect shall be attached thereto by the employer immediately on receiving notice of such defect or lack of safeguard, and such notice shall not be removed until said defect has been remedied or the machine safeguarded as herein provided.

INDIANA.

Legislature.

1911.

Sec. 9. It shall be the duty of the owner of any aforesad establish-

ment, or his agent, superintendent or other person in charge of the same to furnish and supply, or cause to be furnished and supplied therein, in the discretion of the chief inspector, where machinery is used, belt shifters or other safe mechanical contrivances for the purpose of throwing on or off belts or pulleys; and whenever possible, machinery therein shall be provided with loose pulleys; all vats, pans, saws, planers, cogs, gearing, belting, shafting, set screws and machinery of every description therein shall be properly guarded, and no person shall remove or make ineffective any safeguard around or attached to any planer, saw, belting, shafting or other machinery, or around any vat or pan, while the same is in use, unless for the purpose of immediately making repairs thereto, and all such safeguards shall be promptly replaced. By attaching thereto a notice to that effect, the use of any machinery may be prohibited by the chief inspector, should such machinery be regarded as dangerous. Such notice must be signed by the chief inspector, and shall only be removed after the required safeguards are provided, and the unsafe or dangerous machine shall not be used in the meantime. Exhaust fans of sufficient power shall be provided for the purpose of carrying off dust from emery wheels and grindstones and dust-creating machinery from establishments where used. No person under sixteen years of age, and no female under eighteen years of age, shall be allowed to clean machinery while in motion.

State Board of Health.

1914.

Rule 38. THE COMMON TOWEL.—The use of common towels in schools is condemned and such use is prohibited. Each pupil must have an individual towel, or sanitary paper towels shall be provided.

Legislature.

1915.

Compensation for the loss of an eye.

(d) For the permanent and irrecoverable loss of the sight of one eye or its reduction to one-tenth of normal vision with glasses, 100 weeks.

LOUISIANA

State Board of Health.

1911.

(a) The use of a common towel, or towel to be used in common, by the employes, patrons, frequenters of or the public in any room, closet, pantry, lavatory or washroom in, or attached to any public place, railroad station, boarding house, restaurant, steamboat, saloon, hotel, warehouse, public office, store, factory, workroom, used by the public, or where persons are employed, is forbidden.

Lavatory; Food Supply Establishments.

(b) No person, or corporation, in charge of any place specified in, or within the intent of, Section (a) of this article, whether such charge is as principal or agent, shall furnish such common towel, or towel in common.

133. No barber shall use for the service of a customer any towel or wash cloth that has not been boiled and laundered since last used.

395. Every owner, lessee and tenant and manager of any boarding house or manufactory, shall cause every part thereof, and its appurtenances to be put, and shall thereafter cause the same to be kept, in a cleanly and wholesome condition, and shall speedily cause every department thereof in which any person may sleep, dwell, or work, to be adequately lighted and ventilated; and, if the same be a manufactory, shall cause every part thereof in which any person may work, to be maintained at such temperature, and be provided with such accommodation and safeguards, as not, by reason of the want thereof, or of anything about the condition of such manufactory or its appurtenances, to cause any unnecessary danger of detriment to the life or health of any person being properly therein or thereat.

MISSOURI.

Legislature.

1913.

Sec. 1. That every employer of labor in this state, engaged in carrying on any work, trade or process which may produce any illness or disease peculiar to the work or process carried on, or which subjects the employe to the danger of illness or disease incident to such work, trade or process, to which employes are exposed, shall, for the protection of all employes engaged in such work, trade or process, adopt and provide approved and effective devices, means or methods for the prevention of such industrial or occupational diseases as are incident to such work, trade or process.

Sec. 2. The carrying on of any process, or manufacture, or labor in this state in which antimony, arsenic, brass, copper, lead, mercury, phosphorus, zinc, their alloys or salts or any poisonous chemicals, minerals, acids, fumes, vapors, gases, or other substances, are generated or used, employed or handled by the employes in harmful quantities, or under harmful conditions, or come in contact with in a harmful way, are hereby declared to be especially dangerous to the health of the employes.

Sec. 3. Every employer in this state to which this act applies shall provide for and place at the disposal of the employes so engaged, and shall maintain in good condition without cost to the employes, working clothes to be kept and used exclusively by such employes while at work, and all employes therein shall be required at all times while they are at work to use and wear such clothing; and in all processes of manufacture or labor referred to in this section which are productive of noxious or poisonous dusts, adequate and approved respirators shall be furnished and maintained by the employer in good condition and without cost to the employes, and such employes shall use such respirators at all times while engaged in any work productive of noxious or poisonous dusts.

Sec. 4. Every employer engaged in carrying on any process or manufacture referred to in section 2 of this act, shall, as often as once every calendar month, cause all employes who come into direct contact with the poisonous agencies or injurious processes referred

to in section 2 of this act, to be examined by a competent licensed and reputable physician for the purpose of ascertaining if there exists in any employe any industrial or occupational disease or illness or any disease or illness due or incident to the character of the work in which the employe is engaged.

Sec. 5. It is hereby made the duty of any licensed physician who shall make a physical examination of any employe under the provisions of section 4 of this act, to make within twenty-four hours a triplicate report thereof to the state board of health of the state of Missouri upon blanks to be furnished by said board upon request, and if any such disease or illness is found, the physician shall so report, and if any such disease is found, the report shall state the name and address and business of such employer and the nature of the disease in precise and definite terms of all the diseases or illness with which the employe is afflicted and the probable extent and duration thereof, the name and business of employer, and the last place and length of employment: Provided, that the failure of any such physician to receive blanks from the state board of health for making such a report shall not excuse the physician from making the report as herein required. Any physician who shall fail to make a report as required by this section shall be deemed guilty of a misdemeanor and upon conviction shall be fined not less than fifty dollars (\$50.00), and in each case shall stand committed until such fine and costs are paid unless otherwise discharged by due process of law.

Sec. 6. The secretary of the state board of health shall, immediately upon receipt of any report from any physician in accordance with the provisions of section 5 of this act, transmit a copy thereof to the state factory inspector, and a copy to the superintendent of the factory in which the employe is supposed to have contracted his ailment.

Sec. 7. Every employer engaged in carrying on any process or manufacture or labor referred to in section 2 of this act, shall provide, separate and apart from the workshop in which such employes are engaged, a dressing room and lavatory for the use of such employes who are exposed to poisonous or injurious dusts, fumes and gases, and such lavatory shall be kept and maintained in a hygienic and sanitary manner and provided with a sufficient number of basins or spigots with adequate washing facilities, including hot and cold water, clean individual towels and soap, and sufficient shower baths, and the dressing room shall be furnished with compartment lockers, so that the ordinary street clothes of such employes shall be kept separate and apart from their working clothes. Male and female employes shall be provided for separately.

Sec. 8. No employe shall take or be allowed to take any food or drink of any kind into any room or apartment in which any process or manufacture or labor referred to in section 2 of this act is carried on, or in which poisonous substances or injurious or noxious fumes, dusts or gases, are present as the result of such work or process being carried on in such room or apartment, and the employes shall not remain in any such room or apartment during the

time allowed for meals, and suitable provision shall be made and maintained by the employer for enabling the employes to take their meals elsewhere in such place of employment, and a sufficient number of sanitary drinking fountains containing wholesome drinking water, and providing ice for same, shall be provided and maintained for the use of the employes within reasonable access and without cost to them.

Sec. 9. All employers engaged in carrying on any process of manufacture or labor referred to in section 2 of this act shall provide and maintain adequate devices for carrying off all poisonous or injurious fumes from any furnaces which may be employed in any such process or manufacture or labor, and shall also provide and maintain adequate and efficient facilities for carrying off all injurious dust, and the floors in any room or apartment where such work or process is carried on shall be kept and maintained in a smooth and hard condition, and no sweeping shall be permitted during working hours except where the floor in such workshop is dampened so as to prevent the raising of dust; and all ore, slag, dross and fume shall be kept in some room or apartment separate from the work occupied by the employes, and all mixing and weighing of such ore, slag, dross or fume shall be done in such separate room or apartment, and all such material shall be dampened or covered before being handled or transported by employes.

Sec. 10. When any flues or other apparatus are used in any such process or manufacture or labor referred to in section 2 of this act, and when such flues or other apparatus are being cleaned or emptied, the employer shall in every case provide and maintain a sufficient, adequate and efficient means or device, such as canvas bags or other approved device, or by dampening the dust, or some other efficient method for catching and collecting the dust and preventing it from unreasonably fouling or polluting the air in which the employes are obliged to work, and, wherever practicable, the dust occasioned in any process or manufacture referred to in section 2 of this act, and in any polishing or finishing therein, shall be dampened or wet down or covered, and every reasonable precaution shall be adopted by the employer to prevent the unnecessary creation or raising of dust, and all floors shall be washed or scrubbed at least once every working day; and such parts of the work or process as are especially dangerous to the employes, on account of poisonous fumes, dusts and gases, shall, where practicable, be carried on in separate rooms and under cover of some suitable and efficient device to remove the danger to the health of such employes as far as may be reasonably consistent with the manufacturing process, and the fixtures and tools employed in any such process or manufacture or labor shall be thoroughly washed and cleaned at reasonable intervals.

Sec. 11. All hoppers or chutes or similar devices used in the course of any process or manufacture referred to in section 2 of this act shall be provided with a hood or covering, and an adequate and efficient apparatus or other proper device for the purpose of drawing away from the employes noxious, poisonous or injurious

dusts, and preventing the employes from coming into unnecessary contact therewith; and all conveyances or receptacles used for the transportation about or the storage in any place where any such process or manufacture or labor referred to in section 2 of this act is carried on, shall be properly covered or dampened in such a way as to protect the health of the employes, and no refuse of a dangerous character incident to the work or process carried on in any such place shall be allowed to remain accumulated on the floors thereof.

Sec. 12. It shall be the duty of the state factory inspector to enforce the provisions of this act and to prosecute all violations of the same before any magistrate or any court of competent jurisdiction in this state, and for that purpose the state factory inspector and his assistants are empowered to and shall visit and inspect, at least once a year, and at reasonable hours, and as often as practicable, all places of employment covered by the provisions of this act.

Sec. 13. For the purpose of disseminating a general knowledge of the provisions of this act and of the dangers to the health of employes in any work or process covered by the provisions of this act, the employer shall post in a conspicuous place in every room or apartment in which any such work or process is carried on, appropriate notices of the known dangers to the health of any such employes arising from such work or process, and simple instructions as to any known means of avoiding, so far as possible, the injurious consequences thereof, and the state factory inspector shall have prepared a notice covering the salient features of this act, and furnish a reasonable number of copies thereof to employers in this state affected by the provisions of this act, which notice shall be posted by every such employer in a conspicuous place in every room or apartment in such place of employment. The notices required by this section shall be printed on cardboard of suitable character and the type used shall be such as to make them easily legible.

Sec. 14. Any person, firm or corporation who shall, personally or through any agent, violate any of the provisions of this act, or who fails or refuses to comply with any of its requirements, or who obstructs or interferes with any examination or investigation being made by the state department of factory inspection in accordance with the provisions of this act, or any employee who shall violate any of the provisions of this act, shall be deemed guilty of a misdemeanor and on conviction thereof shall be punished by a fine of not less than twenty-five dollars (\$25.00) nor more than two hundred dollars (\$200.00), and in each case shall stand committed until such fine and costs are paid, unless otherwise discharged by due process of law.

Sec. 15. In this act, unless the context otherwise requires, "employer" includes persons, partnerships and corporations.

Sec. 7828. Belting, etc., to be guarded: The belting, shafting, machines, machinery, gearing and drums, in all manufacturing, mechanical and other establishments in this state, when so placed as to be dangerous to persons employed therein or thereabout while engaged in their ordinary duties, shall be safely and securely guarded when possible; if not possible, then notice of its danger shall be conspicuously posted in such establishments. (Amended, Laws 1909.)

Sec. 7842. Health and safety of factory employes to be guarded: Whenever the factory inspector, or assistant inspector, finds that the heating, lighting, ventilation or sanitary arrangements of any establishment where labor is employed is such as to be dangerous to the health or safety of employes therein or thereat, or the means of egress, in case of fire or other disaster, are not sufficient, or that the building, or any part thereof, is unsafe, or that the belting, shafting, gearing, elevators, drums or other machinery are located so as to be dangerous to employes, and not sufficiently guarded, or that the vats, pans, ladles or structures filled with molten or hot liquid, or any furnace, be not sufficiently surrounded with proper safeguards, or the platforms, passageways and other arrangements around, in or about any railroad yard or switch be such as to probably lead to injury or accident to those employed in, around or about any such establishment or place, the factory inspector or assistant inspector shall at once notify the person or persons in charge of such establishment or place to make the alterations or additions necessary within thirty days; and if such alterations or additions be not made within thirty days from the date of such notice, or within such time as said alterations could be made with proper diligence, then such failure to make such alterations shall be deemed a violation of this article. (Amended, Laws 1909.)

PENNSYLVANIA.

State Board of Health.

1913.

Second: "No person, persons or corporation within the Commonwealth of Pennsylvania shall furnish for public use any towel unless such towel be laundered or discarded after each individual use."

Third: "Barbers are hereby forbidden to use a common brush for brushing the eyes of their patrons unless such brush be disinfected after each individual use."

Dept. of Labor and Industry.

1914.

Sec. 1. Be it enacted, etc., That every employer shall, without cost to the employes, provide reasonably effective devices, means, and methods to prevent the contraction by his employes of any illness or disease incident to the work or process in which such employes are engaged in the industries and occupations specified in section 2 of this act.

Sec. 2. Every work or process in the manufacture of white lead, red lead, litharge, sugar of lead, arsenate of lead, lead chromate, lead sulphate, lead nitrate, or fluo-silicate is hereby declared to be especially dangerous to the health of the employes who, while engaged in such work or process are exposed to lead dusts, lead fumes, or lead solutions.

Sec. 3. Every employer shall, without cost to the employes, provide the following devices, means, and methods for the protection of his employes, who, while engaged in any work or process included in section 2, are exposed to lead dusts, lead fumes, or lead solutions:

(a) The employer shall provide and maintain workrooms, adequately lighted and ventilated, and so arranged that there is a continuous and sufficient change of air; and all such rooms shall be fully separated by partition walls from all departments in which the work or process is of non-dusty character; and all such rooms shall be provided with a floor permitting an easy removal of dust by wet methods or vacuum cleaning, and all such floors shall be so cleaned daily.

Every work or process referred to in section 2, including the corroding or oxidizing of lead, and the crushing, mixing, sifting, grinding and packing of all lead salts or other compounds referred to in section 2, shall be so conducted, and such adequate devices provided and maintained by the employer, as to protect the employe as far as possible from contact with lead dust or lead fumes. Every kettle, vessel, receptacle, or furnace in which lead, in any form referred to in section 2, is being melted or treated, and any place where the contents of such kettles, receptacles, or furnaces are discharged, shall be provided with a hood connected with an efficient air-exhaust; all vessels or containers, in which dry lead in any chemical form or combination referred to in section 2 is being conveyed from one place to another within the factory, shall be equipped, at the places where the same are filled or discharged, with hoods having connection with an efficient air-exhaust; and all hoppers, chutes, conveyors, elevators, separators, vents from separators, dumps, pulverizers, chasers, dry pans, or other apparatus for drying pulp lead, dry-pans, dump, and all barrel packers and cars, or other receptacles into which corrosions are at the time being emptied, shall be connected with an efficient dust-collecting system; such system to be regulated by the discharge of air from a fan, pump, or other apparatus, either through a cloth dust-collector, having an area of not less than one-half square foot of cloth to every cubic foot of air passing through it per minute, the dust-collector to be placed in a separate room, which no employe shall be required or allowed to enter except for essential repairs while the works are in operation, or such other apparatus as will efficiently remove the lead dusts from the air of the workrooms.

(b) The employer shall provide a washroom, or rooms, which shall be separate from the workrooms, be kept clean, and be equipped with:

(1) Lavatory basins, fitted with waste pipes and two spigots conveying hot and cold water; or

(2) Basins placed in troughs fitted with waste pipes, and for each basin two spigots conveying hot and cold water; or

(3) Troughs of enamel or similar smooth impervious material, fitted with waste pipes, and for every two feet of trough length two spigots conveying hot and cold water.

Where basins are provided there shall be at least one basin for every five such employes; and where troughs are provided, at least two feet of trough length for every five such employes. The employer shall also furnish nail brushes and soap, and shall provide at least three clean towels per week for each such employe. A time allow-

ance of not less than ten minutes, at the employer's expense, shall be made to each such employe for the use of said washroom before the lunch hour and at the close of the day's work.

Sec. 8. The State Department of Labor and Industry shall enforce this act, and prosecute all violations of the same. The officers or their agents, of the said department, shall be allowed at all reasonable times to inspect any place of employment included in this act.

The employer engaged in the manufacture of white lead, red lead, litharge, sugar of lead, arsenate of lead, lead chromate, lead sulphate, lead nitrate, or fluo-silicate shall also provide at least one shower bath for every ten such employes. The baths shall be approached by wooden runways, be provided with movable wooden floor gratings, be supplied with controlled hot and cold water, and be kept clean. The employer shall furnish soap, and shall provide at least two clean bath towels per week for each such employe. An additional time allowance of not less than ten minutes, at the employer's expense, shall be made to each such employe for the use of said baths, at least twice a week, at the close of the day's work. The employer shall keep a record of each time that such baths are used by each employe, which record shall be open to inspection at all reasonable times by the State Department of Labor and Industry, and also by the State Department of Health.

(c) The employer shall provide a dressing room, or rooms which shall be separate from the workrooms, be furnished with a double sanitary locker or two single sanitary lockers for each such employe, and be kept clean.

(d) The employer shall provide an eating room or eating rooms, which shall be separate from the workrooms, be furnished with a sufficient number of tables and seats, and be kept clean. No employe shall take, or be allowed to take, any food or drink of any kind into any workroom, nor shall any employe remain, or be allowed to remain, in any workroom during the time allowed for his meals.

(f) The employer shall provide at least one pair of overalls and one pair of jumpers for each such employe, and repair or renew such clothing when necessary, and wash the same weekly.

(g) The employer shall provide, and renew when necessary, at least one reasonably effective respirator for each employe who is engaged in any work or process included in section 2.

Sec. 4. Every employe who, while engaged in any work or process included in section 2, is exposed to lead dusts, lead fumes, or lead solutions, shall—

(a) Use the washing facilities provided by the employer in accord with section 3 (b), and wash himself at least as often as a time allowance is therein granted for such use.

(b) Use the eating room provided by the employer in accord with section 3 (d), unless the employe goes off the premises for his meals.

(c) Put on, and wear at all times while engaged in such work or process, a suit of the clothing provided by the employer in accord with section 3 (f), and remove the same before leaving at the close of the day's work, and keep his street clothes and his working

clothes, when not in use, in separate lockers or separate parts of the locker provided by the employer in accord with section 3 (c).

(d) Keep clean the respirators provided by the employer in accord with section 3 (g), and use one at all times while he is engaged in any work or process included in section 2 of this act.

Sec. 5. The employer shall post in a conspicuous place in every workroom where any work or process included in section 2 is carried on, in every room where washing facilities are provided, and in every dressing room and eating room, a notice of the known dangers arising from such work or process, and simple instructions for avoiding as far as possible such dangers. The Commissioner of Labor and Industry shall prepare a notice containing the provisions of this act, and shall furnish free of cost a reasonable number of copies thereof to every employer included in section 2, and the employer shall post copies thereof in the manner hereinbefore stated. The notices required in this section shall be printed in plain type, on cardboard, and shall be in English and in such other languages as the circumstances may reasonably require. The contents of such notices shall be explained to every employe by the employer, when the said employe enters employment in such work or process; interpreters being provided by the employer when necessary to carry out the above requirements.

Sec. 6. The employer shall cause every employe who while engaged in any work or process included in section 2, is exposed to lead dusts, lead fumes, or lead solutions, to be examined at least once a month, for the purpose of ascertaining if symptoms of lead poisoning appear in any employe. The employe shall submit himself to the monthly examination, and to examination at such other times and places as he may reasonably be requested by the employer, and he shall fully and truly answer all questions bearing on lead poisoning asked him by the examining physician. The examinations shall be made by a licensed physician, designated and paid by the employer, and shall be made during the working hours, a time allowance therefor at the employer's expense being made to each employe so examined.

Sec. 7. Every physician making an examination, under section 6, and finding what he believes to be symptoms of lead poisoning, shall enter, in a book kept for that purpose in the office of the employer, a record of such examination, containing the name and address of the employe so examined, the particular work or process in which he is engaged, the date, place, and finding of such examination, and the directions given in each case by the physician. The record shall be open to inspection at all reasonable times by the State Department of Labor and Industry and by the State Department of Health.

Within forty-eight hours after such examination and finding, the examining physician shall send a report thereof, in duplicate, one copy to the State Department of Labor and Industry and one to the State Department of Health. The report shall be on, or in conformity with, blanks to be prepared and furnished by the State Department of Health, free of cost, to every employer included in sec-

tion 2, and shall state: (a) name, occupation, and address of employee; (b) name, business, and address of employer; (c) nature and probable extent of disease; and (d) such other information as may be reasonably required by the State Department of Health.

The examining physician shall, also, within the said forty-eight hours, report such examination and finding to the employer; and after five days from such report the employer shall not continue the said employe in any work or process where he will be exposed to lead dusts, lead fumes, or lead solutions, included in section 2 of this act.

Sec. 8. The State Department of Labor and Industry shall enforce this act, and prosecute all violations of the same. The officers, or their agents, of the said department, shall be allowed at all reasonable times to inspect any place of employment included in this act.

Every employer who, either personally or through any agent, violates or fails to comply with any provisions of section 1 or section 3, shall be guilty of a misdemeanor and on conviction, for the first offense, shall be sentenced to pay a fine of not less than one hundred (\$100) dollars, nor more than two hundred (\$200) dollars; and on conviction for a second offense shall be sentenced to pay a fine of not less than two hundred (\$200) dollars, nor more than five hundred (\$500) dollars; and on conviction for each subsequent offense shall be sentenced to pay a fine of not less than three hundred (\$300) dollars, nor more than one thousand (\$1,000) dollars; and in each case he shall stand committed until such fine and the costs are paid, or until he is otherwise discharged by due process of law.

Every employe who violates or fails to comply with any provision of section four shall be guilty of a misdemeanor; and on conviction, for the first offense, shall be sentenced to pay a fine of not less than ten (\$10) dollars, nor more than twenty (\$20) dollars; and on conviction for the second offense shall be sentenced to pay a fine of not less than twenty (\$20) dollars, nor more than fifty (\$50) dollars; and on conviction for each subsequent offense, not less than thirty dollars, nor more than one hundred (\$100) dollars; and in each case he shall stand committed until such fine and the costs are paid, or until he is otherwise discharged by due process of law.

Every employer who, either personally or through any agent, violates or fails to comply with any provisions of sections 5, 6 or 7 relating to him, and every employe who violates or fails to comply with the provisions of section 6 relating to him, shall be guilty of a misdemeanor, and on conviction thereof shall be sentenced to pay a fine of not less than ten (\$10) dollars, nor more than one hundred (\$100) dollars.

Sec. 11. The owner or person in charge of an establishment where machinery is used shall provide belt shifters or other mechanical contrivances for the purpose of throwing on or off belts or pulleys. Whenever practicable, all machinery shall be provided with loose pulleys. All vats, pans, saws, planers, cogs, gearing, belting, shafting, set screws, grindstones, emerywheels, flywheels, and machinery of every description shall be properly guarded. The floor space of no working room in any establishment shall be so crowded

with machinery as thereby to cause risk to the life or limb of an employe; nor shall there be in any establishment machinery in excess of the sustaining power of the floors and walls thereof. No person shall remove or make ineffective any safeguard around or attached to machinery, vats or pans while the same are in use, except for the purpose of immediately making repairs thereto, nad all such safeguards so removed shall be properly replaced. Exhaust fans of sufficient power, or other sufficient devices, shall be provided for the purpose of carrying off poisonous fumes and gases, and dust from emery wheels, grindstones and other machinery creating dust. If a machine or any part thereof is in a dangerous condition, or is not properly guarded, the use thereof may be prohibited by the Chief Factory Inspector or by his deputy, and a notice to that effect shall be attached theeto. Such notice shall not be removed until the machinery is made safe and the required safeguards are provided, and in the meantime such unsafe or dangerous machinery shall not be used.

Sec. 13. The owner, agent, lessee, or other person having charge or managerial control of any establishment, shall provide or cause to be provided not less than two hundred and fifty cubic feet of air-space for each and every person in every workroom in said establishment, where persons are employed, and shall provide that all workrooms, halls and stairways in said establishment be kept in a clean and saritary condition and properly lighted.

Sec. 1. Be it enacted, etc., that all persons, companies, or corporations operating any factory or workshop where emery-wheels or emery-belts of any description are used, either solid emery, leather, leather-covered, felt, canvas, linen, paper, cotton, or wheels or belts rolled or coated with emery or corundum, or cotton-wheels used as buffs, shall provide the same with blowers, or similar apparatus, which shall be placed over, beside, or under such wheels or belts, in such a manner as to protect the person or persons using the same from the particles of dust produced and caused thereby, and to carry away the dust arising from or thrown off by such wheels or belts, while in operation, directly to the outside of the building, or to some receptacle placed so as to receive and confine such dust: Provided, That grinding machines upon which water is used at the point of the grinding contact shall be exempt from the provisions of this act; and, provided, this act shall not apply to factories or workshops where men are not employed continuously at such wheels or belts more than three hours in twenty-four hours.

Sec. 2. It shall be the duty of any person, company, or corporation operating any such factory or workshop to provide or construct such appliances, apparatus, machinery, or other things necessary to carry out the purpose of this act, as set forth in the preceding section, as follows: Each and every wheel shall be fitted with a sheet of cast iron, or hood or hopper, of such form, and so applied to such wheel or wheels, that the dust or refuse therefrom will fall from such wheels, or will be thrown into such hood or hopper by centrifugal force, and be carried off by the current of air into a suction-pipe attached to same hood or hopper.

Sec. 3. This act shall become operative on the first day of January, one thousand nine hundred and fourteen.

Industrial Board.

1915.

Caution:—Employes shall not remove or make ineffective any safeguards while same are in use, except for the purpose of making repairs, and such safeguards so removed shall be replaced.

Note:—Polishing and Grinding Machines shall have all exposed collars, set screws, shafts, couplings, clutches, keys, pulleys, gears, fly wheels and belts guarded as specified in Safety Standards, Volume I, No. 1.

Eye Protection.

(x) Approved eye protection shall be provided for operators on grinding wheels if the operation involves the possibility of eye injury.

Lighting and Heating.

Sec. 9. Where natural light is insufficient properly to light the foundry, artificial light of sufficient power shall be provided, in the discretion of the Industrial Board.

Sec. 10. Interior walls of foundries shall be whitened, in the discretion of the Industrial Board.

Chip guards shall be provided on lathes and other machines for the protection of nearby persons as well as the operator, where there is an eye hazard by reason of flying chips or cuttings. Goggles will be considered adequate protection for the operator.

Eye protection in all lathe, machine and grinding work shall be carefully considered.

(e) All factories used for the manufacture of food products shall be clean, properly lighted and ventilated. The ceilings shall be of sufficient height to permit ample clearance for all work under any suspended shafting, hangers, piping, galleries, etc. Where natural light and ventilation are insufficient, provision shall be made for augmenting the same by mechanical methods. The interiors of all working rooms shall be kept a light color by paint, whitewash or other suitable method.

Removal of Smoke, Steam, Gases and Dust.

Sec. 4. Where smoke, steam, gases or dust arising from any of the operations of the foundry are dangerous to health or eyes and where a natural circulation of air does not carry off such smoke, steam, gases or dust, there shall be installed and operated hoods, ventilators, fans or other mechanical means of ventilation approved by the Industrial Board.

Sec. 5. The cleaning and chipping of castings shall be done in cleaning rooms except that where traveling cranes or where, in existing installations cars are used for conveying castings into such rooms, a separating partition shall be erected which shall not be less than twelve (12) feet in height. In existing installations, where the crane cage or crane girders will not permit the erection of a twelve-foot partition, the height of the partition may be reduced sufficiently to permit of the clearance of same. Large castings may be chipped or cleaned by hand in the molding and casting room, provided sufficient protection is furnished by the use of a curtain or screen or some

other means equally good to protect employes who are otherwise employed therein. This regulation shall not apply if mechanical contrivances are used for cleaning castings and the dust and particles arising therefrom are effectively removed at the point of origin by means of an exhaust system.

Sec. 6. Where tumbler mills are used, exhaust systems shall be installed to effectively carry off the dust arising from the cleaning of castings except where the mill is operated outside the foundry. This regulation shall not prohibit the use of a water barrel to clean castings. Sand blast operations shall be carried on in the open air or in a separate room used solely for such purpose. The milling of cupola cinders, when done inside the foundry, shall be carried on by an exhaust mill or water mill, each of a type approved by the Industrial Board.

Section 7. The floor beneath and immediately surrounding the cupola shall slope and drain away from the base of same.

Section 8. Cores shall not be blown out of castings by compressed air unless such work is done outside the foundry or in a special room or dustproof enclosure approved by the Industrial Board. Men employed in cleaning castings by compressed air or sand blast shall wear eye guards and helmets approved by the Industrial Board.

Brass Foundries:

Section 38. Brass foundries shall be provided with natural light from at least two sides or from at least one side, and skylights in roof.

Legislature,
MICHIGAN.

1914.

(331) Section 1. Every physician attending or called upon to treat a patient whom he believes to be suffering from poisoning from lead, phosphorus, arsenic or mercury, or their compounds, or from anthrax, or from compressed air illness, contracted as a result of the nature of the patient's employment, shall send to the state board of health, who shall transmit to the commissioner of labor a notice stating the name, postoffice address and place of employment of the patient, the length of time of such employment, and the disease from which in the opinion of the physician, the patient is suffering.

(332) Section 2. Any physician who shall fail to make any report required by the preceding section, or who shall wilfully make any false statement in such report, shall be deemed guilty of a misdemeanor and on conviction thereof shall be punished by a fine of not more than fifty dollars.

(333) Section 3. It shall be the duty of the commissioner of labor and of the prosecuting attorney of the county where any one violating the provisions of this act may reside, to prosecute all violators of the provisions of this act which shall come to the knowledge of them or either of them.

Legislature,
1915.

Safeguards on Belts, Gearing and Dangerous Machinery.

Section 15. It shall be the duty of the owner of any factory, store-

house or warehouse, or his agent, superintendent or other person in charge of the same, to furnish or supply or cause to be furnished or supplied, in the discretion of the factory inspector, where machinery is in use, proper shifters or other mechanical contrivances for the purpose of throwing belts on or off pulleys. All gearing or belting shall be provided with proper safeguards, and whenever possible machinery shall be provided with loose pulleys. All vats, saws, pans, planers, cogs, set-screws, gearing and machinery of every description shall be properly guarded when deemed necessary by the factory inspector.

Section 16. Exhaust fans shall be provided for the purpose of carrying off dust from emery wheels and grindstones and dust-creating machinery, wherever deemed necessary by the factory inspector.

Foundries shall be reasonably well lighted throughout working hours, and reasonably well heated during the cold and inclement weather.

Section 27. All persons, companies or corporations operating any factory or workshop, where wheels or emery belts of any description are in general use, either leather, leather covered, felt, canvas, paper, cotton or wheels or belts rolled or coated with emery or corundum, or cotton wheels used as buffs, shall provide the same with fans or blowers or similar apparatus, which shall be placed in such a position or manner as to protect the person or persons using the same from the particles of dust produced and caused thereby, and to carry the dust arising from, or thrown off by such wheels or belts while in operation, directly to the outside of the building or to some other receptacle placed so as to receive and confine such dust: Provided, That grinding machines upon which water is used at the point of grinding contact shall be exempt from the conditions of this act: Provided further, That this act shall not apply to solid emery wheels used in saw mills or planing mills or other wood working establishments.

VERMONT.

1913.

The Legislature has appointed a factory inspector, and in Section 3 certain portions of his duties are defined as follows:

Section 3. Said inspector may enter any factory, mill, workshop, private works or state institutions which have shops or factories, when the same are open or in operation, and to examine into the methods of protection from danger to employes and the sanitary condition in and around such buildings and places, and to make a record of such inspection. A person who refuses to allow the inspector to so enter, or refuses to give the information authorized to be obtained under the provisions of this section shall be fined not more than one hundred dollars, or be imprisoned not more than ninety days, or both. If said inspector finds upon such inspection that the heating, lighting, ventilation, or sanitary arrangement of any workshop or factory is such as to be injurious to the health of the persons employed or residing therein or that the means of egress in case of fire or other disaster are not sufficient, or that the belting, shafting, gearing, elevators, drums, saws, cogs or machinery in such workshop or factory are located, or are in condition, so as to be dangerous to employes and not sufficiently

guarded, or that vats, pans or any other structures filled with molten metal or hot liquids, are not surrounded with proper safeguards for preventing accidents or injury to those employed at or near them, he shall give written notice to the owner, proprietor or agent of such workshop or factory to make, within thirty days, the alterations or additions by said inspector deemed necessary for the safety and protection of the employees; and if such alterations or additions are not made within thirty days from the date of such written notice, or within such time as said alterations or additions can be made with proper diligence upon the part of such proprietors, owners or agents, said proprietors, owners or agents so notified shall be fined not more than two hundred dollars nor less than twenty-five dollars, or be imprisoned not more than thirty days.

Use of the Common or Roller Towel Prohibited.

At a meeting of the State Board of Health held at Burlington, May 1, 1913, the following regulation was adopted and is hereby promulgated:

Whereas, it has been demonstrated that the use of the common or roller towel is dangerous to the public health and is a source of communication of infectious diseases; therefore, under the authority of the statute imposed upon the State Board of Health to promulgate rules and regulations relative to the preservation of public health in contagious diseases and prevention of the same, the use of the roller towel, or any other towel which may be used for more than one service, is hereby prohibited in any school, hotel, restaurant, boarding house, saloon, club house, public lavatory, wash room, depot or railroad car, or any other public place.

VERMONT.

1913.

The following rules and regulations have been adopted by Department of Factory Inspection and must be strictly observed.

Machinery.

Art. 1. Cog Gearings. All cog gearings should be completely cased in, casing to be so constructed that it can be easily removed when necessary to repair or oil, which can be made of wood or metal.

Art. 2. Fly Wheels. All fly wheels of engines and belt wheels should be enclosed by casing in or placing substantial railing around them, either of wood or gas pipe. The latter preferable and more substantial.

Art. 4. Belts. All belts passing through floors or vertical shafting operating through floors shall be cased in to the height of four feet.

Art. 5. All circular and band saws should be provided with a hoop guard, and the lower wheels of band saws should be entirely enclosed, when possible to do so, and employees compelled to use such guards at all times.

Art. 6. Set-Screws, Keys and Dead Ends. Protruding set-screws in collars and couplings on line and countershafting should be covered or countersunk. Set-keys in hubs or fly or other wheels should be cut off flush with the end of shaft or covered with tin casing or other material fitting closely to shaft, forming a smooth surface. To be more

explicit: Protruding set-screws in collars and couplings on line and countershafting should be covered or countersunk, and keys should not be allowed to project from end of shaft. All dead ends of shafting should have a smooth casing.

Art. 7. Shifting Belts. Loose pulleys should be used whenever possible, so as to throw a saw, jointer, shaper or other piece of machinery out of motion when not necessarily in use, and employees instructed to throw out of motion such machine when leaving same temporarily.

Shifters should be used at all times for shifting belts, and no employee should be allowed to shift a belt with his hands or stick; belts should be laced and adjusted when machinery is not in motion.

Art. 9. Gearings. All cog or bevel gearings, where exposed to outside contact, should have a removable casing, so that they will be completely covered but easily oiled.

Art. 14. Warning Notices. Notices should be posted stating that any employee removing guards, or other safety appliances from the machinery, do so at his or her own peril.

WISCONSIN.
Legislature,
1913.

Compensation for the Loss of an Eye.

In addition to the usual accident compensation, eye injuries are compensated for as follows:

The loss of an eye by enucleation, 160 weeks;

The loss of the second eye, by enucleation, 320 weeks;

Total blindness of one eye, 120 weeks;

Total blindness of the second eye, 240 weeks.

Industrial Commission Appointed by Legislature,
1915.

Order 4. Belt Shifters. All loose pulleys must be furnished with a permanent belt shifter, so located as to be within easy reach of the operator. The belt-shifter must be so constructed as to make it impossible for the belt to creep from the loose pulley back on the tight pulley. All belt shifters must be equipped with a lock or some other efficient device which will prevent the shifter from being accidentally shifted.

Order 8. Emery Wheels, Hoods and Guards. Emery wheels used for grinding purposes must be equipped with a hood connected with an exhaust fan or water system. A guard must be provided, as a part of the hood construction or in addition to the hood, which shall be strong enough to withstand the shock of a bursting wheel. This guard must be adjusted close to the wheel and extend over the top of the wheel to a point 30 degrees beyond a vertical line drawn through the center of the wheel. The exhaust or water system is not required on emery wheels which are in general use by all employes in common, to touch up tools or castings, or emery wheels used for sharpening saws.

Order 28. Drop Hammers, Flying Scales. When drop hammers which throw off sparks and scales are located near a passageway

where persons pass along to the rear of the machine, a shield must be provided to stop the sparks and scales.

Order 46. Eye Protection. Where men are doing work whereby any substance is thrown off which may injure the eyes, suitable goggles or spectacles or other efficient guard must be provided by the employer.

Note. The compensation law provides for a penalty of 15 per cent where injury results from the employe's willful failure to use safety devices provided by the employer or to obey any reasonable rule adopted by the employer for the safety of the employes.

Where properly fitted goggles are furnished by the employer and where the employe refuses to use the goggles and is injured, the employe will be penalized 15 per cent in awarding compensation. By the term "properly fitted" is meant goggles which fit comfortably over the nose and around the eye and the lenses are properly spaced for the eyes.

Order 54. Vats and Tanks Guarded. All vats and tanks which contain hot liquids, acids or other injurious chemicals; or vats and tanks which are of sufficient depth to be dangerous, and where such vats and tanks are exposed to contact, must be guarded.

Order 2009. Sandblast Operators, Protection. The employer must furnish the employes who are working in sand blast rooms with a suitable covering for the face, which will protect the eyes, nose and mouth; such protector should be worn by the employe when working in the sand blast room.

Order 2014. Foundries, Foregshops and Roundhouses, Ventilation. All foundries, forge shops, roundhouses and other places of employment in which smoke, gas, dust or vapors are present in sufficient quantities to obstruct the vision, or to be irritating, obnoxious or injurious to the health, must be equipped with a system of ventilation which will eliminate such smoke, gas, dust or vapors insofar as the conditions of the industry will permit. Such system of ventilation must change the air in the room not less than twice each hour, and must supply the room with an additional amount of air to make up for the loss of oxygen which is consumed by the fires. Each person in the room must be supplied with not less than 1800 cubic feet of fresh air each hour.

Note. The above standard of ventilation for foundries and forge shops can be secured with proper window space on the sides, sufficient height of roof, and with adequate lantern provisions in the roof.

Order 2012. Vats and Tanks Which Emit Fumes. All vats and tanks containing liquids which emit fumes, or vapors of ammonia, arseniuretted hydrogen, carbon dioxide, carbon monoxide, carbon tetrachloride, chlorine, gases from pickling vats, lead and mercury, phosgene, sulphur dioxide, hydrochloric acid, nitric acid, sulphuric acid, prussic acid, or other fumes or vapors which are irritating, obnoxious or injurious to the health, must be equipped with a ventilating system which will remove as much of the fumes or vapors as the character of the work will permit.

Shop Lighting.

Order 2100. Natural Light Required. Each place of employment

hereafter constructed must be supplied with adequate natural light during the working daylight hours.

Order 2101. *Artificial Light Required.* Each place of employment at present constructed and which is not so equipped as to furnish adequate natural light during the working daylight hours, must be supplied with artificial light as specified in Orders 2102 to 2105, inclusive.

Order 2102. *Artificial Light Where No Gas or Smoke.* Each place of employment in which hand or machine operations are performed must be supplied during the working hours, when daylight is not available, with artificial light equivalent in amount, for each four square feet of floor space, to not less than the light produced by a one-candle power lamp hung 10 feet from the floor.

Order 2103. *Artificial Light Where Gas and Smoke.* In foundries, forge shops and other industries where there is smoke and gas which obstruct the light, sufficient artificial light must be supplied to overcome the obstruction and to furnish the standard amount of light on the floor specified in Order 2102.

Note. It has been found from experience in foundries and forge shops, that the proper amount of light is secured when the standard of light specified in Order 2102 is increased 100 per cent.

Order 2104. *Warehouses and Storage Places.* Each place of employment in which hand or machine operations are not performed, such as warehouses, vat rooms and storage places, must be supplied during the working hours, when daylight is not available, with artificial light equivalent in amount for each eight square feet of floor space, to not less than the light produced by a one-candle power lamp hung ten feet from the floor.

Order 2105. *Light for Fine Work.* In each place of employment where fine or close work is being done, such as fine lathe work, engraving, typesetting and drafting, and where the standard of light specified in Orders 2102 and 2103 are not sufficient to prevent injurious eye strain, sufficient light must be provided in every case to avoid unnecessary eye strain.

Note. In many cases it is advisable to provide individual lights for each machine, bench or table. It is exceedingly important that these lights be equipped with proper reflectors which can be kept clean, and which so reflect the light that the eyes are not subjected to the glare of the light, and eye strain is avoided.

Order 2106. *Yards, Roadways, etc.* All yards, roadways, stairways, tramways, and other places outside of buildings which are frequented by employes in the course of their employment, must be supplied with natural or artificial light during the working hours so that every part of such place is easily discernible.

Note. (a) *Standards Based on Experience.* The standards for artificial lighting specified in Orders 2100 to 2106, inclusive, are based on the experience of a large number of reputable manufacturing concerns which have worked out the problems of shop lighting, both from the standpoint of efficiency as well as safety. These standards are as low as can be safely adopted to secure results. Many concerns have adopted standards considerably higher than these. The standards of light for departments in which hand or machine operations are per-

formed, as specified in Orders 2102 and 2103, have been found to be adequate for a large per cent of the factories in which woodworking machinery is operated, and in factories in which course work is being done on benches, forges or on metal working machines. In such factories where the proper standard of general illumination has been installed, it has been found unnecessary to use individual lights.

Note. (b) Reflectors for Lamps. Each lamp used for either general illumination or individual lighting should be equipped with a reflector made of white enameled steel, porcelain, glass or similar material which will not be tarnished by the gas and smoke, and which can be kept clean. The reflectors used for general illumination should be so shaped as to concentrate and distribute the light on the working plane which is usually within seven feet of the floor. It has been found that a properly designed reflector will add about 35 per cent to the efficiency of the lamp. These reflectors should be kept clean. It has been demonstrated that it adds from 25 per cent to 50 per cent to the efficiency of a reflector to keep it clean.

Note. (c) Walls Whitened, Windows Clean. In all places of employment where there is not excessive smoke and gas, the walls and ceilings should be kept properly whitened with paint or whitewash. It has been demonstrated that in departments where the walls are whitened the natural and artificial light is increased about 20 per cent. It also adds materially to the natural light to keep the windows clean.

Order 2217. In all places of employment the use of towels in common is prohibited.

TENNESSEE.
Legislature,
Publication of 1913.

Section 1. Be it enacted by the General Assembly of the State of Tennessee, That every building, room, basement or cellar occupied or used as a bakery, confectionery, packing house, slaughter house, dairy, creamery, cheese factory, restaurant, hotel, grocery, meat market, or other place or apartment used for the sale, manufacture, packing, storage, sale or distribution or any food shall be properly lighted, drained, plumbed and ventilated.

Section 5. Be it further enacted, That each deputy inspector of workshops and factories assigned to a district for the inspection of workshops and factories therein shall carefully inspect the sanitary conditions, system of sewerage, situation and condition of water closets, system of heating, lighting and ventilating rooms where persons are employed at labor, and the means of exit in case of fire or other disasters, within or connected with such workshops and factories. They shall examine the belting, shafting, gearing, elevators, drums and machinery in and about such workshops and factories, and see that they are not so located as to be dangerous to employes when engaged in their ordinary duties, and so far as practicable securely guarded; they shall see that each vat, pan or structure filled with molten lead or hot liquid is surrounded by proper safeguard for preventing accident or injury to persons employed at or near them.

Legislature,
1915.

Section 6. Be it further enacted, That every factory, workshop, association or other establishment where work or process is carried on by which dust, filaments or injurious gases are produced or generated, that are liable to be inhaled by persons employed therein, the person, firm or corporation by whose authority the said work or process is carried on shall cause to be provided and used in said workshop, factory, association or other establishment, exhaust fans, conveyors, receptacles, or blowers with pipes and hoods extending therefrom to each machine, contrivance or apparatus by which dust, filaments or injurious gases are produced or generated; or provide other mechanical means to be maintained for the purpose of carrying off or receiving such dust, filaments, devitalized air, or other impurities as may be detrimental to the health of those in, about, or in connection with such place as herein mentioned. Provided, that if natural ventilation sufficient to exclude the harmful element above enumerated be provided, the requirement of this section shall have been complied with by such firm, corporation, association or other establishment as herein mentioned. Said fans, blowers, pipes and hoods shall be properly fitted and adjusted and of power and dimensions sufficient to effectually prevent the dust, filaments or injurious gases produced or generated by said machines, contrivances or apparati from escaping into the atmosphere of the room or rooms of said factory, workshop or other establishment where persons are employed.

Section 12. Be it further enacted, That no person shall remove or make ineffective any safeguard around or attached to any machinery, vats, pans or apparatus, except for the purpose of making repairs thereon, and all safeguards so removed shall be replaced promptly. Provided, that when the machine, or any part thereof, is found to be in a dangerous condition, notice shall be attached thereto, and such notice shall not be removed until the machinery is made safe and the required safeguards are provided, and in the meantime such unguarded or dangerous machinery shall not be in use.

MINNESOTA.
1913.

Section 1. Every physician attending on or called in to visit a patient whom he believes to be suffering from poisoning from lead, phosphorous, arsenic or mercury or their compounds or from anthrax, or from compressed air illness, contracted as a result of the nature of the patient's employment, shall send to the commissioner of labor a notice stating the name and full postal address and place of employment of the patient and the disease from which, in the opinion of the physician, the patient is suffering, with such other specific information as may be required by the commissioner of labor and which may be ascertained by the physician in the course of his duties.

MINNESOTA.
Legislature,
1915.

Section 2. Every owner of a factory, mill or work shop where

machinery is in use shall furnish or cause to be furnished, whenever practicable, belt shifters or other safe mechanical contrivance for the purpose of throwing belts on or off pulleys; and whenever practicable, machinery shall be provided with loose pulleys. Whenever in the opinion of the labor commissioner it becomes necessary, exhaust fans of sufficient power or other devices shall be provided for carrying off dust from emery wheels, grind stones and other dust creating machinery.

Section 6. All vats, pans or other receptacles containing molten metal or hot or corrosive liquids, or otherwise dangerous liquids, shall be below the floor level.

Section 8. No employes in any factory, mill, work shop, or upon any engineering work, nor any other person, by permission or otherwise, shall remove, displace or destroy any guard for dangerous machinery, or other safety device, which the employer shall have provided under the requirements of this chapter, or any other law, save under rules established by the employer therefor. Safety appliances removed for the purpose of making repairs, adjustments, or for other purposes permitted or required by the employer shall be immediately replaced when such purpose is accomplished.

NEW JERSEY.

State Board of Health,
1913.

Approved April 1, 1912.

1. Every physician attending upon or called in to visit a person whom he believes to be suffering from poisoning from lead, phosphorus, arsenic or mercury, or their compounds, or from anthrax, or from compressed air illness, contracted as a result of such person's occupation or employment, shall within thirty days after his first professional attendance upon such person, send to the State Board of Health a written notice, stating the name and full postoffice address, and place of employment of such person, and the nature of the occupation, and the disease or ailment from which, in the opinion of such physician, the person is suffering, with such other specific information as may be required by the State Board of Health.

2. Any physician who shall fail to perform the duty imposed by section one of this act, within the time therein limited, shall be liable to a penalty of twenty-five dollars for each offense. Any penalty incurred under the provisions of this act shall be sued for and recovered in an action of debt by and in the name of the Board of Health of the State of New Jersey. All penalties collected under this act shall be paid by said board into the treasury of the State of New Jersey.

3. It shall be the duty of the Board of Health of this State to enforce the provisions of this act, and it may call upon the local boards of health and health officers of such local boards of health for assistance. It shall be the duty of all local boards of health and all health officers, when so called upon for such assistance, to render the same. It shall be the duty of the said Board of Health of this State to transmit any data received under the provisions of section one of this act to the Commissioner of Labor of this State.

IOWA.

1913.

Section 4999—a2. Duties of Parties in Charge. It shall be the duty of the owner, agent, superintendent or other person having charge of any manufacturing or other establishment where machinery is used, to furnish and supply or cause to be furnished and supplied therein, belt shifters or other safe mechanical contrivances for the purpose of throwing belts on and off pulleys, and, wherever possible, machinery therein shall be provided with loose pulleys; all saws, planers, cogs, gearing, belting, shafting, set-screws and machinery of every description therein shall be properly guarded. No person under sixteen years of age, and no female under eighteen years of age shall be permitted or directed to clean machinery while in motion.

Children under sixteen years of age shall not be permitted to operate or assist in operating dangerous machinery of any kind. (Twenty-ninth G. A., Ch. 149, Sec. 2.)

Section 4999—a4. Blowers and Pipes. All persons, companies or corporations operating any factory or workshop where emery wheels or emery belts of any description, or tumbling barrels used for rumbling or polishing castings, are used, shall provide the same with blowers and pipes of sufficient capacity, placed in such a manner as to protect the person or persons using same from the particles of dust produced or caused thereby, and to carry away said particles of dust arising from or thrown off such wheels, belts or tumbling barrels while in operation, directly to the outside of the building, or to some receptacle placed so as to receive or confine such particles or dust; provided, however, that grinding machines upon which water is used at the point of grinding contact, and small emery wheels which are used temporarily for tool grinding, are not included within the provisions of this section, and the shops employing not more than one man at such work may, in the discretion of the commissioner of the bureau of labor of the state, be exempt from the provisions hereof. Any factory, workshop, print shop or other place where molten metal or other material which gives off deleterious gases or fumes is kept or used shall be equipped with pipes or flues so arranged as to give easy escape to such gases or fumes into the open air, or provided with other adequate ventilators.

OHIO.

Legislature,

1913.

Section 989. Inspection of Work Shops and Factories. Each district inspector of workshops and factories assigned to a district for the inspection of shops and factories therein, shall carefully inspect the sanitary conditions, system of sewerage, situation and condition of water-closets, system of heating, lighting and ventilating rooms where persons are employed at labor, and the means of exit in case of fire or other disaster, within or connected with such shops and factories. He shall examine the belting, shafting, gearing, elevators, drums and machinery in and about such shops and factories, and see that they are not so located as to be dangerous to employes when engaged in their ordinary duties, and, so far as practicable, securely guarded. He

shall see that each vat, pan or structure filled with molten metal or hot liquid is surrounded by proper safeguards for preventing accident or injury to persons employed at or near them. (95 v. 338 §3.)

Section 1027. Safeguarding Machinery. The owners and operators of shops and factories shall make suitable provisions to prevent injury to persons who use or come in contact with machinery therein or any part thereof as follows:

6. They shall light the hallways, rooms, approaches to rooms, basements and other places wherein sufficient daylight is not obtainable.

7. They shall guard all saws, wood-cutting, wood-shaping and all other dangerous machinery.

8. They shall provide shifters for shifting belts, and poles and other appliances for removing, replacing and repairing belts or single pulleys.

11. They shall provide emery wheels or belts of solid emery, leather covered, felt, canvas, linen, paper, cotton or wheels or belts, rolled or coated with emery or corundum, or cotton wheels used as buffs, with blowers or similar apparatus placed over, beside or under such wheels or belts in such a manner as to protect the person or persons using them from particles or dust produced and caused thereby.

12. They shall provide each emery wheel with a sheet or cast-iron hood or hopper of such form and so applied to it that the dust or refuse therefrom will fall from such wheels or will be thrown into such hood or hopper by centrifugal force and be carried off by the current of air into a suction pipe attached to such hood or hopper.

13. They shall provide an emery wheel six inches or less in diameter with a three-inch suction pipe, an emery wheel six inches to twenty-four inches in diameter with a four-inch suction pipe; an emery wheel twenty-four inches to thirty-six inches in diameter with a five-inch suction pipe and every emery wheel larger than those provided for with a suction pipe not less than six inches in diameter. Such suction pipe shall be full sized to the main trunk suction pipe, and the main suction pipe to which smaller pipes are attached shall be equal in its diameter and capacity to the combined area of the smaller pipes attached to it. The discharge pipe from the exhaust fan connected with pipe or pipes shall be as large or larger than the suction pipe.

Section 1028. Penalty. Whoever, being a person, firm or corporation, fails to comply with any provision of the preceding section, or fails to comply with such orders for changes as are issued by the chief inspector, within thirty days thereafter shall be fined not less than one hundred dollars nor more than three hundred dollars for each offense. All fines collected under this section shall inure to the benefit of the county hospital for tuberculosis. In prosecution for violations of this section by or under the direction of the chief inspector, such inspector shall not be required to give security for costs or adjudged to pay any costs. In case where the accused is acquitted, the costs shall be paid from the treasury of the county in which such proceedings were brought.

Section 6330-2. Especially Dangerous Works or Processes. Every work or process in the manufacture of white lead, red lead, litharge, sugar of lead, arsenate of lead, lead chromate, lead sulphate, lead nitrate or fluo-silicate, is hereby declared to be especially dangerous to the health of the employes, who, while engaged in such work or process, are exposed to lead dusts, lead fumes or lead solutions.

Section 6330-3. Duties of Employers to Provide Safety Appliances for the Protection of Employes in Especially Dangerous Works or Processes. Every employer shall, without cost to the employes, provide the following devices, means and methods for the protection of his employes who while engaged in any work or process included in section 2, are exposed to lead dusts, lead fumes or lead solutions:

(a) Working rooms, hoods and air exhausts for the protection of employes engaged in any work or process which produces lead dusts or lead fumes. The employer shall provide and maintain workrooms adequately lighted and ventilated, and so arranged that there is a continuous and sufficient change of air, and all such rooms shall be fully ventilated and separated by partition walls from all departments in which the work or process is of a non-dusty character; and all such rooms shall be provided with floor permitting an easy removal of dust by wet methods or vacuum cleaning, and all such floors shall be so cleaned daily.

Every work or process referred to in section 2, including the corroding or oxidizing of lead, and the crushing, mixing, sifting, grinding and packing of all lead salts or other compounds referred to in section 2, shall be so conducted and such adequate devices provided and maintained by the employer as to protect the employe, as far as possible, from contact with lead dust or lead fumes. Every kettle, vessel, receptacle or furnace in which lead in any form referred to in section 2 is being melted or treated, and any place where the contents of such kettles, receptacles or furnaces are discharged, shall be provided with a hood connected with an efficient air exhaust; all vessels or containers in which dry lead in any chemical form or combination referred to in section 2, is being conveyed from one place to another within the factory shall be equipped, at the places where the same are filled or discharged, with hoods having connection with an efficient air-exhaust; and all hoppers, chutes, conveyors, elevators, separators, vents from separators, dumps, pulverizers, chasers, dry-pans or other apparatus for drying pulp lead, dry-pans dump, and all barrel packers and cars to other receptacles into which corrosions are at the time being emptied shall be connected with an efficient dust-collecting system; such system to be regulated by the discharge of air from a fan, pump or other apparatus, either through a cloth dust-collector having an area of not less than one-half square foot of cloth to every cubic foot of air passing through it per minute, the dust-collector to be placed in a separate room which no employe shall be required or allowed to enter, except for essential repairs, while the works are in operation; or such other apparatus as will efficiently remove the lead dusts from the air before it is discharged into the outer air.

(b) **Washing Facilities.** The employer shall provide a wash room or rooms which shall be separate from the work rooms, be kept clean, and be equipped with: (1) lavatory basins fitted with waste pipes and two spigots conveying hot and cold water, or

(2) Basins placed in troughs fitted with waste pipes and for each basin two spigots conveying hot and cold water, or

(3) Troughs of enamel or similar smooth impervious material fitted with waste pipes, and for every two feet of trough length two spigots conveying hot and cold water.

Where basins are provided there shall be at least one basin for every five employes, and where troughs are provided, at least two feet for every five such employes. The employer shall also furnish nail brushes and soap, and shall provide at least three clean towels per week for each such employe. A time allowed of not less than ten minutes, at the employer's expense, shall be made to each such employe for the use of said wash room before the lunch hour and at the close of the day's work.

The employer shall also provide at least one shower bath for every five such employes. The baths shall be approached by wooden runways, be provided with movable wooden gratings, be supplied with controlled hot and cold water, and be kept clean. The employer shall furnish soap, and shall provide at least two clean bath towels per week for each such employe. An additional time allowance of not less than ten minutes, at the employer's expense, shall be made to each such employe for the use of said baths at least twice a week at the close of the day's work. The employer shall keep a record of each time that such baths are used by such employe, which record shall be open to inspection at all reasonable times by the (state department of factory inspection) and also by the (state board of health).

(c) **Dressing Rooms.** The employer shall provide a dressing room or rooms which shall be separate from the work room, be furnished with a double locker or two single sanitary lockers for each such employe and be kept clean.

(d) **Eating Rooms.** The employer shall provide an eating room or eating rooms which shall be separate from the work rooms, be furnished with a sufficient number of tables and seats, and be kept clean. No employe shall take or be allowed to take any food or drink of any kind into any work room, nor shall any employe remain or be allowed to remain in any work room during the time allowed for his meals.

(f) **Clothing.** The employer shall provide at least two pairs of overalls and two jumpers for each employe, and repair or renew such clothing when necessary, and wash the same weekly. Such clothing shall be kept exclusively for the use of that employe.

(g) **Respirators.** The employer shall provide, and renew when necessary, at least two reasonably effective respirators for each employe who is engaged in any work or process which produces lead dusts.

Section 6330-4. Duties of Employes in Especially Dangerous Works or Processes to Use the Safety Appliances Provided by the Em-

ployers. Every employe who, while engaged in any work or process included in section 2, is exposed to lead dusts, lead fumes or lead solution, shall:

(a) Use the washing facilities provided by the employer in accord with section 3 (b) and wash himself at least as often as a time allowance is therein granted for such use.

(b) Use the eating room provided by the employer in accord with section 3 (d), unless the employe goes off the premises for his meals.

(c) Put on, and wear at all times while engaged in accord with section 3 (f) and remove the same before leaving at the close of the day's work; and keep his street clothes and his working clothes, when not in use, in separate lockers or separate parts of the locker provided by the employer in accord with section 3 (c).

(d) Keep clean the respirators provided by the employer in accord with section 3 (g), and use one at all times while he is engaged in any work or process which produces lead dusts.

Section 6330-5. Notices. The employer shall post in a conspicuous place in every work room where any work or process included in section 2 is carried on, room where washing facilities are provided, dressing rooms and eating room. A notice of the known dangers arising from such work or process, and simple instructions for avoiding, as far as possible, such dangers. The (chief state factory inspector) shall prepare a notice containing the provision of this act, and shall furnish, free of cost, a reasonable number of copies thereof to every employer included in section 2, and the employer shall post copies thereof in the manner hereinabove stated. The notices required in this section shall be printed in plain type on cardboard, and shall be in English and in such other languages as the circumstances may reasonably require. The contents of such notices shall be explained to every employe by the employer when the said employe enters employment in such work or process, and in addition shall be read to all employes at least once a month, interpreters being provided by the employer when necessary to carry out the above requirements.

Section 6330-6. Medical Examination. The employer shall cause every employe who, while engaged in any work or process included in section 2, is exposed to lead dusts, lead fumes or lead solutions, to be examined at least once a month for the purpose of ascertaining if symptoms of lead poisoning appear in any employe. The employe shall submit himself to the monthly examination and to examination at such other times and places as he may reasonably be requested by the employer, and he shall fully and truly answer all questions bearing on lead poisoning asked him by the examining physician. The examinations shall be made by a licensed physician, designated and paid by the employer, and shall be made during the working hours, a time allowance therefor, at the employer's expense, being made to each employe so examined.

Section 6330-7. Record and Reports of Medical Examination. Every physician making any examination under section 6 and finding what he believes to be symptoms of lead poisoning shall enter,

in a book to be kept for that purpose in the office of the employer, a record of such examination containing the names and addresses of the employe so examined, and particular work or process in which he is engaged, the date, place and finding of such examination, and the directions given in each case by the physician. The record shall be open to inspection at all reasonable times by the (state department of factory inspection) and by the (state board of health).

Within forty-eight hours after such examination and finding, the examining physician shall send a report thereof in duplicate, one copy to the (state department of factory inspection) and one to the (state board of health). The report shall be open or in conformity with blanks, to be prepared and furnished by the (state board of health), free of cost, to every employer included in section 2, and shall state:

- (a) Name, occupation and address of employe.
- (b) Name, business and address of employer.
- (c) Nature and probable extent disease.
- (d) Such other information as may be reasonably required by the (state board of health).

The examining physician shall also, within the said forty-eight hours, report such examination and finding to the employer, and after five days from such report the employer shall not continue the said employe in any work or process where he will be exposed to lead dusts, lead fumes or lead solutions, nor return the said employe to such work or process without a written permit from a licensed physician.

Section 6330-8. Enforcement. The (state department of factory inspection) shall enforce this act and prosecute all violations of the same. The officers, or their agents, of the said (department) shall be allowed at all reasonable times to inspect any place of employment included in this act.

Section 6330-9. Penalties. Every employer, who either personally or through any agent violates or fails to comply with any provision of section 1 or section 3 shall be guilty of a misdemeanor, and on conviction for the first offense shall be fined not less than one hundred dollars nor more than two hundred dollars, and on conviction for the second offense, not less than two hundred dollars nor more than five hundred dollars, and on conviction for each subsequent offense, not less than three hundred dollars nor more than one thousand dollars, and in each case he shall stand committed until such fine and the costs are paid, or until he is otherwise discharged by due process of law.

Every employe who violates or fails to comply with any provision of section 4, shall be guilty of a misdemeanor, and on conviction for the first offense shall be fined not less than ten dollars nor more than twenty-five dollars, and on conviction for the second offense, not less than twenty dollars nor more than fifty dollars, and on conviction for each subsequent offense not less than thirty dollars nor more than one hundred dollars, and in each case he shall stand committed until such fine and the costs are paid, or until he is otherwise discharged by due process of law.

Every employer who, either personally or through any agent, violates or fails to comply with any provision of sections 5, 6 or 7, relating to him, and every employe who violates or fails to comply with the provision of section 6 relating to him shall be guilty of a misdemeanor, and on conviction thereof shall be fined not less than ten dollars nor more than one hundred dollars.

Section 6330-10. Definition. In this act, unless the context otherwise requires, "employer" includes persons, partnerships and corporations.

I. Special Powers of the State Board of Health to Make a Survey of Occupational Diseases and Industrial Hygiene.

House Joint Resolution No. 12, adopted by the General Assembly of the State of Ohio, February 13th, 1913, empowers the State Board of Health as follows: "The State Board of Health is hereby authorized and directed to make a thorough investigation of the effect of occupations upon the health of those engaged therein, with special reference to dust, dangerous chemicals and gases, to insufficient ventilation and lighting, and to such conditions as in the opinion of said Board may be specially injurious to health, and to report to the next General Assembly the results of such investigation, with such recommendations for legislation or other remedial measures as it may deem proper and advisable."

II. Physicians to Report Occupational Diseases to the State Board of Health.

House Bill No. 187, passed March 25th, 1913, provides that every physician attending on, or called in to visit a patient whom he believes to be suffering from poisoning from lead, phosphorus, arsenic, brass, wood alcohol, mercury, or their compounds, or from anthrax, or from compressed air illness, or any other ailment or disease, contracted as a result of the nature of the person's employment, shall report the same to the State Board of Health within forty-eight hours, by mail, upon the standard schedule blanks provided by the State Board of Health. Such reports cannot be used for evidence in any legal action. (Blanks for reporting such cases can be obtained by addressing the Secretary of the State Board of Health, Hartman Building, Columbus, Ohio.)

III. The Prevention of Occupational Diseases With Special Reference to the Manufacture of Certain Lead Compounds.

House Bill No. 483, passed April 18th, 1913, provides as follows:

(1) Employers are to provide reasonably effective devices, means and methods to prevent occupational diseases.

(2) Especially dangerous works or processes are named which are concerned with the manufacture of certain lead compounds.

(3) The duties of employers as regards devices and means for prevention of occupational diseases are given in reference to:

Working rooms.

Washing facilities.

Shower baths.

Basins.

Eating rooms.

Drinking fountains.

Clothing.

Dressing rooms.

Respirators.

(4) Employees are obliged to use the appliance provided.

(5) Notices in various languages concerning the dangers arising in various processes and simple instructions to employes for avoiding them, are furnished by the Chief Inspector of workshops and factories and public buildings to every employer, and the employer is to post such notices in every room where such dangerous processes are engaged in, and also to explain to new employes the contents of these notices, and shall have them read at least once a month, interpreters to be provided when necessary.

(6) The employer must have every employe who is engaged in the dangerous processes specified examined at least once a month by a licensed physician, designated and paid by the employer, the examination to be made during working hours and at the employer's expense.

(7) The examining physician must make a record of the symptoms, and certain other specified data, in a book to be provided for that purpose, and kept in the office of the employer. This record is to be open to inspection at all reasonable times by the State Department of Factory Inspection and by the State Board of Health.

In addition, the examining physician is to send a report thereof to the State Department of Factory Inspection, and to the State Board of Health, upon the blanks especially prepared for this purpose by the State Board of Health.

The examining physician must also report the case to the employer, who, within five days, shall remove the employe from any work in which he might be exposed to lead poisoning. Such employe can not return to lead exposed processes without a written permit from a licensed physician.

(8) The enforcement of this act is left to the State Department of Factory Inspection.

(9) Penalties are provided for violations of this act by either employer or employe.

(House Joint Resolution No. 12.)

Laws of Ohio, 1913, Vol. 103, p. 975.

JOINT RESOLUTION

Authorizing and directing the state board of health to make an investigation of occupational diseases.

Whereas, The employment of men and women in certain occupations is known to be attended with more than ordinary danger to health, giving rise to what is known as "occupational diseases," and

Whereas, Unnecessary sickness and shortening of life, from whatever cause, is a serious loss and of grave concern to the state and to all the people, and

Whereas, It is believed to be possible, by public education and by the enforcement of proper measures, to largely prevent unnecessary sickness and premature death among employes in various trades and occupations, therefore,

Be it resolved by the General Assembly of the State of Ohio, That the state board of health is hereby authorized and directed to make a thorough investigation of the effect of occupations upon the health

of those engaged therein with special reference to dust and dangerous chemicals and gases, to insufficient ventilation and lighting, and to such other unhygienic conditions as in the opinion of said board may be specially injurious to health, and to report to the next general assembly the results of such investigation, with such recommendations for legislative or other remedial measures as it may deem proper and advisable.

Be it further resolved, That the finance committee of the House and the Senate be requested to place in the general appropriation bill an appropriation of \$7,000 for the year 1913 and \$7,000 for the year 1914 for carrying on the above work by the state board of health.

(Signed) C. L. SWAIN,
Speaker of the House of Representatives.

(Signed) HUGH L. NICHOLS,
President of the Senate.

Adopted February 13th, 1913.

Laws of Ohio, 1913, Vol. 103, p. 184.

AN ACT

To require the reporting of certain occupational diseases.

Be it enacted by the General Assembly of the State of Ohio:

Section 1. Every physician in this state attending on or called in to visit a patient whom he believes to be suffering from poisoning from lead, phosphorus, arsenic, brass, wood alcohol, mercury or their compounds, or from anthrax, or from compressed air illness, or any other ailment or disease, contracted as a result of the nature of the patient's employment, shall within forty-eight hours from the time of first attending such patient send to the state board of health a report stating:

- (a) Name, address and occupation of patient.
- (b) Name, address and business of employer.
- (c) Nature of disease.
- (d) Such other information as may be reasonably required by the state board of health.

The reports herein required shall be made on, or in conformity with, the standard schedule blanks hereinafter provided for. The mailing of the report, within the time required, in a stamped envelope addressed to the office of the state board of health, shall be a compliance with this section.

Section 2. The state board of health shall prepare and furnish, free of cost, to the physicians included in the preceding section, standard schedule blanks for the reports required under this act. The form and contents of such blanks shall be determined by the state board of health.

Section 3. Reports made under this act shall not be evidence of the facts therein stated in any action arising out of the disease therein reported.

Section 4. It shall furthermore be the duty of the state board

of health to transmit a copy of all such reports of occupational diseases to the proper official having charge of factory inspection.

C. L. SWAIN,

Speaker of the House of Representatives.

HUGH L. NICHOLS,

President of the Senate.

Passed March 25, 1913.

Approved April 23, 1913.

JAMES M. COX, Governor.

Filed in office of the Secretary of State April 24, 1913.

KENTUCKY.

1914.

Child Labor Law.

Sec. 10. It shall be the duty of the owner of any manufacturing establishment where any person under twenty-one years of age is employed, his agents, superintendents or other persons in charge of same, to furnish and supply, when practicable or cause to be furnished and supplied to him, belt shifters, or other safe mechanical contrivance for the purpose of throwing belts on or off pulleys; and, whenever practicable, machinery therein shall be provided with loose belts. All vats, pans, saws, planes, cogs, gearings, beltings, set screws and machinery of every description which is palpably dangerous, shall be properly guarded, and no person shall remove or make ineffective any safeguard around or attached to any such appliances or machinery, while the same is in use, unless for the purpose of immediately making repairs thereto, and all such safeguards shall be promptly replaced. No person under eighteen years of age shall be allowed to clean machinery while it is in motion.

VIRGINIA.

Legislature,

1914.

2. The owner or person in charge of a factory, shop, or manufacturing establishment where machinery is used shall provide, in the discretion of the commissioner of labor, belt shifters or other mechanical contrivances for the purpose of throwing on or off belts on pulleys. Whenever practicable, all machinery shall be provided with loose pulleys. All vats, elevators, saws, planers, cogs, gearing, belting, shafting, set screws, shapers and corner machines shall be properly guarded. No person shall remove or make ineffective any safeguard around or attached to machinery, vats or elevators while the same are in use, unless for the purpose of immediately making repairs thereto, and all such safeguards so removed shall be promptly replaced. If a machine or any part thereof is in a dangerous condition, or is not properly guarded, notice thereof shall be given to the owner or manager in charge of such operation, and unless such machinery is repaired or made safe within ten days after such notice the use thereof may be prohibited by the commissioner of labor, and a notice to that effect shall be attached thereto. Such notice shall not be removed until the machine is made safe and the required safe-

guards are provided, and in the meantime such unsafe or dangerous machinery shall not be used.

SOUTH CAROLINA.
State Board of Health,
1914.

The Common Roller towel shall be abolished on all Common Carriers and in waiting rooms.

Barber Shops.

A separate clean towel shall be used for each person.

MAINE.
State Board of Health,
1914.

Section 1. The use of a common drinking cup or a common towel on any railroad train or other common carrier or in the stations, waiting rooms or lavatories connected therewith, or belonging thereto, or in any public, parochial, or private school, or in any state educational institution, or in any hotel or restaurant, or in any theatre or other public place of amusement, is prohibited.

Section 2. No person, firm, corporation, board, or trustee in control of or in charge of any common carrier or building, room, institution, or place mentioned in section 1, shall place, furnish, or keep in place, any drinking cup or towel for public or common use, and no such person, firm, corporation, board, or trustee, shall permit the use of a common drinking cup or a common towel on or in any common carrier, or building, room, institution, or place mentioned in section 1.

Section 3. The term common drinking cup as used herein is defined to be any vessel or utensil used for conveying water to the mouth, and available for common use by the public or the passengers, or guests, or inmates of the places mentioned in section 1. The term common towel as used herein shall be construed to mean roller towel or a towel intended or available for common use by more than one person without being laundered after such use.

Made by the State Board of Health, February 26, 1914. Approved by the Governor and Council, March 25, 1914.

Occupational Diseases.

An act requiring the report to the State Board of Health of certain occupational diseases due to poisoning or other causes.

Section 1. Every physician attending upon or called in to visit a person whom he believes to be suffering from poisoning from lead, phosphorus, arsenic or mercury, or their compounds, or from anthrax, or from compressed air illness, or any other ailment or disease contracted as a result of such person's occupation or employment, shall, within ten days after his first attendance upon such person, send to the State Board of Health a written notice stating the name and full post office address and place of employment of such person, and the nature of the occupation and the disease or ailment from which, in the opinion of the physician, the person is suffering, with such other specific information as may be required by the State Board of Health.

Section 2. In like manner, as is provided in section 1, shall every case of lead poisoning and of suspected lead poisoning, which has resulted from the use of water, which contains lead or is suspected of containing lead, be reported to the State Board of Health and when such reports are received the said board shall do what it can by laboratory work and otherwise to enable the attending physician to determine whether the case is one of lead poisoning, and if so, the source of the poison.

Sec. 3. Any physician who shall fail to perform the duty imposed by section 1 of this act within the time therein limited shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not less than five nor more than ten dollars.

Sec. 4. It shall be the duty of the State Board of Health and of the county attorney of the county wherein any person violating the provisions of this act may reside to prosecute all violations of the provisions of this act which shall come to the knowledge of them or either of them.

—Laws of 1913.

MASSACHUSETTS.

1914.

"Under authority of section 6 of chapter 813 of the Acts of 1913 the Joint State Board of Labor and Industries and Industrial Accidents hereby requires that every physician treating a patient whom he believes to be suffering from poisoning from lead, brass, phosphorus, arsenic or mercury or their compounds, or wood alcohol, or from anthrax, or from compressed air illness, to report within 48 hours to the State Board of Labor and Industries, the information relating thereto called for by the reporting blanks issued by the said board. Every such physician is hereby requested to make reports on the said blanks to the State Board of Labor and Industries of any patient whom he treats that is suffering from any other ailment or disease which the physician believes to have been contracted as a result of the nature, circumstances or conditions of the patient's employment."

MASSACHUSETTS.

State Board of Labor; Industries,

1915.

Industrial Disease. Section 6. The joint board may require every physician treating a patient whom he believes to be suffering from any ailment or disease contracted as a result of the nature, circumstances or conditions of the patient's employment to report such information relating thereto as it may require, within such time as it may fix, to the State Board of Labor and Industries, and may issue a list of such diseases which shall be regularly reported upon by physicians and may add to or change such list at any time. Copies of all such reports and all statistics and data compiled therefrom shall be kept by the State Board of Labor and Industries, and shall be furnished on request to the Industrial Accident Board and the State Board of Health.

Rules and Regulations. Every factory, workshop, manufacturing, mechanical and mercantile establishment shall be well lighted, well ventilated and kept clean and free from unsanitary conditions, accord-

ing to such reasonable rules and regulations as may be adopted with reference thereto by the State Board of Labor and Industries.

Section 1. Upon the request of any member of the inspection department of the district police, or upon the request of any five employes in a factory or workshop, it shall be the duty of the State Board of Labor and Industries established by Chapter 726 of the Acts of the year 1912 to investigate and ascertain whether or not such factory or workshop is adequately lighted. If said board shall be of the opinion, after such investigation, that the factory or workshop is not properly lighted, it shall notify the owner or the person in charge thereof and shall specify what changes should be made in order to light properly the factory or workshop, and the owner or lessee of such factory or workshop shall make the changes so specified as soon as it can be done by the exercise of reasonable diligence.

Sec. 2. Any owner or lessee of a factory or workshop who fails to comply with any order of the State Board of Labor and Industries made under the provisions of Sec. 1 of this act, provided that such failure is not the result of causes beyond the control of the owner or lessee, shall be punished by a fine not exceeding five hundred dollars.

Issuance of Printed Matter on Protection of Eyes.

Section 1. The inspectors of the State Board of Labor and Industries, or such other officers as the said board may from time to time appoint, shall, when obtaining information concerning the proper lighting of factories, workshops and other industrial establishments, make such investigation concerning the eye and vision in their relation to diseases of occupation, including injuries to the eyes of the employes, and to the pathological effects which are produced or promoted by the circumstances under which the various occupations are carried on, as, in the opinion of said board is practicable, and the board shall from time to time issue such printed matter containing suggestions to employers and employes for the protection of the eyes of the employes as it may deem advisable.

Sec. 2. If it appears to an inspector . . . or other officer appointed by said board, that in any factory, workshop or other industrial establishment, from the nature of the work or of the machinery used in connection therewith, or of other circumstances, there is danger of injury to the eyes of employes engaged in such work, and that the danger of injury may be decreased or prevented by any mechanical device or other practicable means, he shall, if said board so directs, order in writing that such device or other means shall be provided therein; and it shall be the duty of the proprietors and managers of the factory, workshop, or other industrial establishment to comply with the order.

Sec. 3. Any person, firm or corporation violating any provision of this act shall be subject to a fine of not less than five nor more than two hundred dollars for every week during which such violation continues: Provided, however, that a criminal prosecution for any violation hereof shall not be begun unless such person, firm or corporation shall, for a period of four weeks after the receipt of an order in writing from an inspector of the Board of Labor and Industries or other

officer, as provided in the preceding section, neglect to comply therewith.

Protection from Dust. Section 86. Any person, firm or corporation operating a factory or workshop in which emery wheels or belts or buffing wheels or belts injurious to the health of employes are used shall provide such wheels and belts with a hood or hopper connected with suction pipes, and with fans or blowers, in accordance with the provisions hereinafter contained, which apparatus shall be so placed and operated as to protect any person using such wheel or belt from the particles or dust produced by its operation, and to convey the particles or dust either outside of the building or to some receptacle so placed as to receive and confine such particles or dust.

Sec. 87. Every such wheel shall be fitted with a sheet iron or cast iron hood or hopper of such form and so placed that the particles or dust produced by the operation of the wheel or of any belt connected therewith shall fall or will be thrown into such hood or hopper by centrifugal force; and the fans or blowers shall be of such size and shall be run at such speed as will produce a volume and velocity of air in the suction and discharge pipes sufficient effectually to convey all particles or dust from the hood or hopper through the suction pipes and so outside of the building or to a receptacle as aforesaid. The suction pipes and connections shall be suitable and efficacious, and such as shall be approved by an inspector of the State Board of Labor and Industries.

Sec. 88. The two preceding sections shall not apply to grinding machines upon which water is used at the point of grinding contact, nor to solid emery wheels used in saw mills or in planing mills or in other wood working establishments, nor to any emery wheel six inches or less in diameter used in establishments where the principal business is not emery wheel grinding.

State Board of Health,
1915.

Common Towels.

Acts of 1912, 59.

State Department of Health May Establish Rules and Regulations.

Section 1. In order to prevent the spread of communicable diseases, the State Board of Health is hereby authorized to prohibit in hotels and in such public places, vehicles or buildings as it may designate the providing of a common towel, and the board may establish rules and regulations for this purpose.

Sec. 2. Whoever violates the provisions of this act, or any rule or regulation of the State Board of Health made under authority hereof, shall be deemed guilty of a misdemeanor and be liable to a fine not exceeding twenty-five dollars for each offense.

[Note. In accordance with the provisions of the above chapter, the State Board of Health, at a regular meeting held April 4, 1912, voted to make the following regulations in relation to providing the common towel:

On and after June 1, 1912, it shall be unlawful to provide a common towel:

(a) In a lavatory used in connection with any public institution, school house, hotel, restaurant, theatre or public hall;

(b) In a lavatory used in connection with any railroad station, railroad car, steam or ferry boat.

The term "common towel," as used in these regulations, shall be considered to mean a roller towel or a towel available for use by more than one person without being washed after such use.]

Guarding of Machinery. Sec. 2. The belting, shafting, gearing, drums and all machinery having movable parts in all factories, mechanical establishments, workshops and mercantile establishments if so placed as to be dangerous to employes therein while engaged in their ordinary duties, shall be, so far as is practicable, securely guarded. No machinery except steam engines in a factory, mechanical establishment, workshop or mercantile establishment shall be cleaned while running if objection in writing is made by one of the inspectors of said board.

Sec. 3. Nothing in this act shall be construed as applying to the belting, shafting, gearing, drums or machinery used in the operation of elevators, nor in any way as affecting the powers of the board of elevator regulations given by Chapter 806 of the Acts of the year 1913.

NEVADA.
Legislature,
1915.

Compensation for the Loss of an Eye.

For permanent total disability, compensation of fifty per cent of the average monthly wage, but not more than sixty dollars nor less than twenty dollars a month, for a period not to exceed one hundred months, total amount not to exceed five thousand dollars.

In case of the following specified injuries, the disability caused thereby shall be deemed total and permanent:

1. The total and permanent loss of sight in both eyes.

For temporary partial disability, one-half of the difference between the wages earned before injury and wages which the injured is able to earn thereafter, but not more than forty dollars a month for a period not to exceed sixty months during the period of such disability.

In the case of any of the following specified injuries, the disability caused thereby shall be deemed a permanent partial disability and the amounts named shall be paid in addition to compensation paid for temporary total disability:

16. For the loss of an eye, fifty per cent of the average monthly wages during twenty-five months.

20. The permanent and complete loss of sight in one eye may be deemed as the loss of one eye.

CALIFORNIA.
1915.

Chapter 485, Sec. 1. Every medical practitioner attending on or called in to visit a patient whom he believe to be suffering from lead, phosphorus, arsenic or mercury or their compounds, or from anthrax or from compressed-air illness, contracted as a result of the nature of the patient's employment, shall send to the State Board of Health a notice

stating the name and full postal address and place of employment of the patient and the disease from which, in the opinion of the medical practitioner, the patient is suffering, and shall be entitled in respect of every bona fide notice sent in pursuance of this section to a fee of fifty cents, to be paid as part of the expense incurred by the State Board of Health in the execution of this act.

MONTANA.

Legislature,

1915.

Compensation for the Loss of an Eye.

For the loss of:

One eye by enucleation.....120 weeks

Total blindness of one eye.....100 weeks

Sec. 50. (a) No employer shall construct, maintain or operate, or cause to be constructed, maintained or operated any place of employment that is not safe.

Sec. 50. (b) No employe shall remove, displace, damage, destroy, or carry off any safety device, or safeguard furnished and provided for use in any employment or place of employment, or interfere in any way with the use thereof by any other person, or interfere with the use of any method or process adopted for protection of any employe in such employment or place of employment, or fail or neglect to do anything reasonably necessary to protect the life and safety of himself and other employes.

IDAHO.

1915.

Sec. 7. Individual Towels. It shall be unlawful for each and every hotel having a public wash room to have what is known as a common towel, but shall keep at all times a sufficient supply of individual clean towels in sight and easy of access to guests.

3. Individual Clean Towels and Suits. All bathing suits and towels furnished patrons shall be clean, and shall not be used by more than one person before laundrying. The use of a common towel, comb and brush is prohibited.

WASHINGTON.

Legislature,

1915.

That any person, firm, corporation or association operating a factory, mill or workshop where machinery is used shall provide and maintain in use, belt shifters or other mechanical contrivances for the purpose of thrown on or off belts on pulleys while running, where the same are practicable, with due regard to the nature and purpose of said belts and the dangers to employes therefrom; also reasonable safeguards for all vats, pans, trimmers, cut-off, gang-edger and other saws, planers, cogs, gearings, belting, shafting, coupling, set-screws, live rollers, conveyors, mangles in laundries and machinery of other or similar description, which it is practicable to guard, and which can be effectively guarded with due regard to the ordinary use of such machinery and appliances, and the dangers to employes therefrom, and with which the employes of any such factory, mill or workshop are

liable to come in contact while in the performance of their duties; and if any machine or any part thereof is in a defective condition, and its operation would be extra hazardous because of such defect, or if any machine is not safeguarded as provided in this act, the use thereof is prohibited, and a notice to that effect shall be attached thereto by the employer or inspector immediately on receiving notice of such defect or lack of safeguard, and such notice shall not be removed until said defect has been remedied or the machine safeguarded as herein provided. (Sec. 1, Chap. 205, '07.)

Any employe of any person, firm, corporation or association shall notify his employer of any defect in, or failure to guard the machinery, appliances, ways, works and plants, with which or in or about which he is working, when any such defect or failure to guard shall come to the knowledge of any said employe, and if said employer shall fail to remedy such defects then said employe may complain in writing to the Commissioner of Labor of any such alleged defects in or failure to guard the machinery, appliances, ways, works and plants, or any alleged violation by such person, firm, corporation or association, of any of the provisions of this act, in the machinery and appliances and premises used by such person, firm, corporation or association, and with or about which such employe is working, and upon receiving such complaint it shall be the duty of the Commissioner of Labor, by himself or his deputy, to forthwith make an inspection of the machinery and appliances complained of. (Sec. 6, Chap. 84, '05.)

State Board of Health,
1915.

The common roller towel shall be abolished on all common carriers and in waiting rooms.

NEW HAMPSHIRE.

Legislature,
1915.

An Act to Restrict the Use of Common Towels.

Be it enacted by the Senate and House of Representatives in General Court convened:

Section 1. In order to prevent the spread of communicable diseases, the use of the common towel is hereby prohibited in all public places, vehicles, or buildings, and the State Board of Health is hereby authorized to enforce this act.

Sec. 2. Whoever violates the provisions of this act, or any rule or regulation of the State Board of Health made under authority hereof, shall be deemed guilty of a misdemeanor and be liable to a fine not exceeding twenty-five dollars for each offense.

Sec. 3. This act shall take effect on the first day of June, 1915.

Approved March 31, 1915.

NEW YORK STATE.

Legislature,
1915.

20—b. Protection of Employees. All factories, factory buildings, mercantile establishments and other places to which this chapter is applicable, shall be so constructed, equipped, arranged, operated and

conducted in all respects as to provide reasonable and adequate protection to the lives, health and safety of all persons employed therein. The industrial board shall, from time to time, make such rules and regulations as will carry into effect the provisions of this section.

Sec. 65. Industrial Poisonings to Be Reported. 1. Every medical practitioner attending on or called in to visit a patient whom he believes to be suffering from poisoning from lead, phosphorus, arsenic, brass, wood alcohol, mercury or their compounds, or from anthrax, or from compressed air illness, contracted as the result of the nature of the patient's employment, shall send to the Commissioner of Labor a notice stating the name and full postal address and place of employment of the patient and the disease from which, in the opinion of the medical practitioner, the patient is suffering, with such other and further information as may be required by the said commissioner.

2. If any medical practitioner, when required by this section to send a notice, fails forthwith to send the same, he shall be liable to a fine not exceeding ten dollars.

3. It shall be the duty of the Commissioner of Labor to enforce the provisions of this section, and he may call upon the state and local boards of health for assistance.

Sec. 81. Protection of Employes Operating Machinery; Dust-Creating Machinery; Lighting of Factories and Workrooms. 1. The owner or person in charge of a factory where machinery is used, shall provide, as may be required by the rules and regulations of the Industrial Board, belt shifters or other mechanical contrivances for the purpose of throwing on or off belts or pulleys. Whenever practicable, all machinery shall be provided with loose pulleys. Every vat and pan wherever set so that the opening or top thereof is at a lower level than the elbow of the operator or operators at work about the same shall be protected by a cover which shall be maintained over the same while in use in such manner as effectually to prevent such operators or other persons falling therein or coming in contact with the contents thereof, except that where it is necessary to remove such cover while any such vat or pan is in use, such vat or pan shall be protected by an adequate railing around the same. Every hydro-extractor shall be covered or otherwise properly guarded while in motion. Every saw shall be provided with a proper and effective guard. Every planer shall be protected by a substantial hood or covering. Every hand-planer or jointer shall be provided with a proper and effective guard. All cogs and gearing shall be boxed or cased either with metal or wood. All belting within seven feet of the floors shall be properly guarded. All revolving shafting within seven feet of the floors shall be protected on its exposed surface by being encased in such a manner as to effectively prevent any part of the body, hair or clothing of the operators or other persons from coming in contact with such shafting. All set-screws, keys, bolts and all parts projecting beyond the surface of revolving shafting shall be countersunk or provided with suitable covering, and machinery of every description shall be properly guarded and provided with proper safety appliances or devices. All machines, machinery, apparatus, furniture and fixtures shall be so placed and guarded in relation to one another as to be safe for all persons. When-

ever any danger exists which requires any special care as to the character and condition of the clothing of the persons employed thereabouts, or which requires the use of special clothing or guards, the industrial board may make rules and regulations prescribing what shall be used or worn for the purpose of guarding against such danger and regulating the provision, maintenance and use thereof. No person shall remove or make ineffective any safeguard or safety appliance or device around or attached to machinery, vats or pans, unless for the purpose of immediately making repairs thereto or adjustment thereof, and any person who removes or makes ineffective any such safeguard, safety appliance or device for a permitted purpose shall immediately replace the same when such purpose is accomplished. It shall be the duty of the employer and of every person exercising direction or control over the person who removes such safeguard, safety appliance or device, or over any person for whose protection it is designed to see that a safeguard or safety appliance or device that has been removed is promptly and properly replaced. All fencing, safeguards, safety appliances and devices must be constantly maintained in proper condition. When in the opinion of the Commissioner of Labor a machine or any part thereof is in a dangerous condition or is not properly guarded or is dangerously placed, the use thereof shall be prohibited by the Commissioner of Labor and a notice to that effect shall be attached thereto. Such notice shall not be removed except by an authorized representative of the Department of Labor, nor until the machinery is made safe and the required safeguards or safety appliances or devices are provided, and in the meantime such unsafe or dangerous machinery shall not be used. The Industrial Board may make rules and regulations regulating the installation, position, operation, guarding and use of machines and machinery in operation in factories, the furnishing and use of safety devices and safety appliances for machines and machinery and of guards to be worn upon the person, and other cognate matters, whenever it finds such regulations necessary in order to provide for the prevention of accidents in factories.

2. All grinding, polishing or buffing wheels used in the course of the manufacture of articles of the baser metals shall be equipped with proper hoods and pipes and such pipes shall be connected to an exhaust fan of sufficient capacity and power to remove all matter thrown off such wheels in the course of their use. Such fan shall be kept running constantly while such grinding, polishing or buffing wheels are in operation; except that in case of wet-grinding it is unnecessary to comply with this provision unless required by the rules and regulations of the Industrial Board. All machinery creating dust or impurities shall be equipped with proper hoods and pipes and such pipes shall be connected to an exhaust fan of sufficient capacity and power to remove such dust or impurities; such fan shall be kept running constantly while such machinery is in use; except where, in case of wood-working machinery, the Industrial Board shall decide that it is unnecessary for the health and welfare of the operatives.

4. All workrooms shall be properly and adequately lighted during working hours. Artificial illuminants in every workroom shall be installed, arranged and used so that the light furnished will at all times

be sufficient and adequate for the work carried on therein, and so as to prevent unnecessary strain on the vision or glare in the eyes of the workers. The Industrial Board may make rules and regulations to provide for adequate and sufficient natural and artificial lighting facilities in all factories.

Regulation 2. Common Towel Forbidden. No person, firm or corporation owning, in charge of, or in control of any lavatory or wash room in any hotel, lodging house, restaurant, factory, store, office building, railway or trolley station, or public conveyance by land or water shall provide in or about such lavatory or wash room any towel for common use. The term "common use" in this regulation shall be construed to mean for use by more than one person without cleansing.

This regulation shall take effect throughout the state of New York, except in the City of New York, on the first day of March, 1915.

Rule 155. The use of any towel or towels in common is prohibited.

Rule 156. If paper towels are supplied, metal receptacles for used towels shall be provided.

Rule 562. Where natural light is insufficient properly to light the foundry, artificial light of sufficient power shall be provided, in the discretion of the Commissioner of Labor.

Rule 563. Interior walls of foundries shall be whitened, in the discretion of the Commissioner of Labor.

Rule 700. Every grinding, polishing and buffing wheel, except such wheels as are used in the manufacture of articles of gold and platinum, shall be provided with a hood connected by means of a pipe to an exhaust fan or other suction device, in such manner as to carry away the dust and refuse thrown off by such wheel to some receptacle so placed as to receive and confine the dust. Every such hood shall be made of metal or other suitable material and be of such form and so located in relation to the grinding surface of the wheel that the dust and refuse therefrom will fall into or be drawn into the hood and be carried off by the pipe attached to it. An emery wheel which is used occasionally by workmen for grinding tools used in the shop shall not be required to be so equipped, provided it has a hood, casing or other device to prevent particles from being thrown upon the operator. Every grinding wheel upon which water is used at the point of grinding contact shall be similarly guarded, but connection with an exhaust shall not be required unless dust is thrown off from such wheel.

Every hood shall be so constructed as to expose the smallest portion of the wheel consistent with efficient operation, and its free edges shall be turned back or faced to prevent injury to the hands of workmen. Where there is likelihood that the hood may scratch the work, the edges of the hood should be covered with leather or other suitable covering.

The Commissioner may modify the requirements of this rule for machines of special types for which it proves impracticable to provide hoods.

D. Lead Dusts and Fumes.

Rule 721. Every work or process in the manufacture or use of

white lead, red lead, litharge, sugar of lead, arsenate of lead, lead chromate, lead sulphate, lead nitrate or fluo-silicate, or in the manufacture of pottery, tiles or porcelain enameled sanitary ware, including the corroding or oxidizing of lead, and the crushing, mixing, sifting, grinding and packing of all lead salts or other compounds shall be so conducted, and such adequate devices provided and maintained by the employer as to protect the employe, as far as possible, from contact with lead dust or lead fumes. Every kettle, vessel, receptacle or furnace in which lead in any form above enumerated is being melted or treated, and any place where the contents of such kettles, receptacles or furnaces are discharged, shall be provided with a hood so constructed and located that the dust or fumes will be drawn into it, and connected with an efficient air exhaust; all vessels or containers in which dry lead in any chemical form or combination above enumerated is being conveyed from one place to another within the factory shall be equipped, at the places where the same are filled or discharged, with hoods having connection with an efficient air-exhaust; and all hoppers, chutes, conveyors, elevators, separators, vents from separators, dumps, pulverizers, chasers, dry-pans, other apparatus for drying pulp lead, dry-pans dump, and all barrel packers and cars or other receptacles into which corrosions are at the time being emptied, shall be connected with an efficient dust-collecting system. Such system shall be regulated by the discharge of air from a fan, or other apparatus, either through a cloth dust-collector having an area of not less than one-half ($\frac{1}{2}$) square foot of cloth to every cubic foot of air passing through it per minute, the dust-collector to be placed in a separate room which no employe shall be required or allowed to enter, except for essential repairs, while the works are in operation; or such other apparatus as will efficiently remove the lead dusts from the air before it is discharged into the outdoor air.

Rule 722. The employer shall provide, and renew when necessary, at least two (2) respirators of approved type for each employe who is engaged in any work or process which produces lead dusts.

Compensation for the Loss of an Eye.

Eye. For the loss of an eye, one hundred and twenty-eight weeks.

5. Limitation. The compensation payment under subdivisions one, two and four and under subdivision three except in case of the loss of a hand, arm, foot, leg or eye, shall not exceed fifteen dollars per week nor be less than five dollars per week; the compensation payment under subdivision three in case of the loss of a hand, arm, foot, leg or eye, shall not exceed twenty dollars per week nor be less than five dollars a week; provided, however, that if the employe's wages at the time of injury are less than five dollars per week he shall receive his full weekly wages.

NEW YORK CITY.

Sanitary Code,
1915.

Sec. 55. Theatres, manufactories, and work rooms; sanitary conditions, lighting, heating and ventilation.—The owner, agent, lessee, tenant, manager and person conducting every theatre, auditorium,

assembly hall, factory, work room, store or office, shall cause every part thereof and its appurtenances to be put, and shall thereafter cause the same to be kept, in a cleanly and sanitary condition, and shall cause every room thereof to be adequately lighted.

Sec. 214. Use of common towels prohibited.—No person, firm or corporation having the management and control of any factory, department store or other business establishment, school, hotel, theatre, concert hall, restaurant, cafe or beer, wine or liquor saloon, railroad station, railroad car, ferry house, ferry boat, public lavatory, public wash room, public comfort station, or any other public place, shall maintain therein or thereat any towel or towels for use in common.

The term "for use in common" as employed herein shall be construed to mean, for the use of or intended to be used by, more than one person.

The term "corporation" as used herein shall be construed to mean and include a municipal corporation. (S. C. Sec. 190.) (As amended by the Board of Health June 30, 1915.)

ILLINOIS.
Legislature,
1915.

An act to provide for the health, safety and comfort of employes in factories, mercantile establishments, mills and work shops in this state, and to provide for the enforcement thereof.

Section 1. Be it enacted by the people of the State of Illinois, represented in the General Assembly: That all power driven machinery, including all saws, planers, wood shapers, jointers, sandpaper machines, iron mangles, emery wheels, ovens, furnaces, forges and rollers of metal; all projecting set screws on moving parts; all drums, cogs, gearing, belting, shafting, tables, fly wheels, flying shuttles and hydro extractors; all laundry machinery, mill gearing and machinery of every description; all systems of electrical wiring or transmission; all dynamos and other electrical apparatus and appliances; all vats or pans, and all receptacles containing molten metal or hot or corrosive fluids, in any factory, mercantile establishment, mill or work shop, shall be so located wherever possible, as not to be dangerous to employes or shall be properly enclosed, fenced or otherwise protected. All dangerous places in or about mercantile establishments, factories, mills or work shops, near to which any employe is obliged to pass, or to be employed shall, where practicable, be properly enclosed, fenced or otherwise guarded. No machine in any factory, mercantile establishment, mill or work shop, shall be used when the same is known to be dangerously defective, and no repairs shall be made to the active mechanism or operative part of any machine when the machine is in motion.

2. Removing and Replacing Safeguards: No person shall remove or make ineffective any safeguard required by this act, during the active use or operation of the guarded machine or device, except for the purpose of immediately making repairs thereto, and all such safeguards so removed shall be promptly replaced.

(a) Where machines require to be started and stopped frequently,

they shall, whenever practicable, be provided with tight and loose pulleys, clutch or other effective disengaging device. When provided with tight and loose pulley, the shifting of the belt shall be accomplished by the use of a belt shifter, placed within easy reach of the operator. When a clutch, or other disengaging device is used, an effective means for throwing such device into or out of engagement shall be provided and shall be placed within easy reach of the operator.

17. *Lights—Where and When Necessary:* In all factories, mercantile establishments, mills or work shops, a proper light shall be kept burning by the owner or lessee in all main passage ways, main hallways, at all main stairs, main stair landings and shafts, and in front of all passenger or freight elevators, upon the entrance floors and upon the other floors, on every work day of the year, from the time that the building is opened for use until the time when it is closed, except at times when the influx of natural light shall make artificial light unnecessary: Provided, that when two or more tenants, occupy different floors in one building, such elevator shafts need be lighted only on the floors occupied and used by employes.

An act to promote the public health by protecting certain employes in this state from the dangers of occupational diseases, and providing for the enforcement thereof.

Section 1. Be it enacted by the people of the State of Illinois, represented in the General Assembly: That every employer of labor in this state, engaged in carrying on any work or process which may produce any illness or disease peculiar to the work or process carried on, or which subjects the employes to the danger of illness or disease incident to such work or process, to which employes are not ordinarily exposed in other lines of employment, shall, for the protection of all employes engaged in such work or process, adopt and provide reasonable and approved devices, means or methods for the prevention of such industrial or occupational diseases as are incident to such work or process.

2. Every employer in this state engaged in the carrying on of any process of manufacture or labor in which sugar of lead, white lead, lead chromate, litharage, red lead, arsenate of lead, or Paris green are employed, used or handled, or the manufacture of brass or the smelting of lead or zinc, which processes and employments are hereby declared to be especially dangerous to the health of the employes engaged in any process of manufacture or labor in which poisonous chemicals, minerals or other substances are used or handled by the employes therein in harmful quantities, or under harmful conditions, shall provide for and place at the disposal of the employes engaged in any such process or manufacture and shall maintain in good condition and without cost to the employes, proper working clothing to be kept and used exclusively for such employes while at work, and all employes therein shall be required at all times while they are at work to use and wear such clothing; and in all processes of manufacture or labor referred to in this section which are unnecessarily productive of noxious or poisonous dusts, adequate and approved respirators shall be furnished and maintained by the employer in good condition and without cost to the employes, and such employes

shall use such respirators at all times while engaged in any work necessarily productive of noxious or poisonous dusts.

3. Every employer engaged in carrying on any process or manufacture referred to in section 2 of this act, shall, as often as once every calendar month, cause all employes who come into direct contact with the poisonous agencies or injurious processes referred to in section 2 of this act, to be examined by a competent licensed physician for the purpose of ascertaining if there exists in any employe any industrial or occupational disease or illness or any disease or illness due or incident to the character of the work in which the employe is engaged.

4. It is hereby made the duty of any licensed physician who shall make the physical examination of employes under the provisions of section 3 of this act, to make an immediate report thereof to the State Board of Health of the State of Illinois upon blanks to be furnished by said board upon request, and if no such disease or illness is found the physician shall so report, and if any such disease is found, the report shall state the name, address, sex and age of such employe and the name of such employer, and the nature of the disease or illness with which the employe is afflicted, and the probable extent and duration thereof, and the last place of employment: Provided, that the failure of any such physician to receive the blanks of the State Board of Health for the making of such report, shall not excuse such physician from making the report as herein provided.

5. The Secretary of the State Board of Health shall, immediately upon receipt of any report from any physician in accordance with the provisions of section 4 of this act, transmit a copy thereof to the Illinois Department of Factory Inspection.

6. Every employer engaged in carrying on any process or manufacture referred to in section 2 of this act, shall provide, separate and apart from the work shop in which such employes are engaged, a dressing room and lavatory for the use of such employes who are exposed to poisonous or injurious dusts, fumes and gases, and such lavatory shall be kept and maintained in a clean and wholesome manner and provided with a sufficient number of basins or spigots, with adequate washing facilities, including hot and cold water, clean towels and soap and shower bath, and the dressing rooms shall be furnished with clothes presses or compartments, so that the ordinary street clothes of such employes shall be kept separate and apart from their working clothes.

7. No employe shall take or be allowed to take any food or drink of any kind into any room or apartment in which any process or manufacture referred to in section 2 of this act is carried on, or in which poisonous substances or injurious or noxious fumes, dusts or gases are present as the result of such work or process being carried on in such room or apartment, and the employes shall not remain in any such room or apartment during the time allowed for meals, and suitable provision shall be made and maintained by the employer for enabling the employes to take their meals elsewhere in such place of employment, and a sufficient number of sanitary closed receptacles containing wholesome drinking water shall be provided and main-

tained for the use of the employees within reasonable access and without cost to them.

8. All employers engaged in carrying on any process or manufacture referred to in section 2 of this act, shall provide and maintain adequate devices for carrying off all poisonous or injurious fumes from any furnaces which may be employed in any such process or manufacture, and shall also provide and maintain adequate facilities for carrying off all injurious dust, and the floors in any room or apartment where such work or process is carried on shall, so far as practicable, be kept and maintained in a smooth and hard condition, and no sweeping shall be permitted during working hours except where the floors in such work shop are dampened so as to prevent the raising of dust; and all ore, slag, dross and fumes shall be kept in some room or apartment separate from the working rooms occupied by the employees, and where practicable, all mixing and weighing of such ore, slag, dross or fume shall be done in such separate room or apartment, and all such material shall, so far as practicable, be dampened before being handled or transported by employees.

9. When any flues are used in any such process or manufacture referred to in section 2 of this act, and such flues are being cleaned out or emptied, the employer shall in every case provide and maintain a sufficient and adequate means or device, such as canvas bags or other practical device, or by dampening the dust, or some other sufficient method for catching and collecting the dust and preventing it from unreasonably fouling or polluting the air in which the employees are obliged to work, and wherever practicable, the dust occasioned in any process or manufacture referred to in section 2 of this act, and any polishing or finishing therein, shall be dampened or wet down, and every reasonable precaution shall be adopted by the employer to prevent the unnecessary creation or raising of dust, and all floors shall be washed or scrubbed at least once every working day; and such parts of the work or process as are especially dangerous to employees, on account of poisonous fumes, dusts and gases, shall, where practicable, be carried on in separate rooms and under cover of some suitable and sufficient device to remove the danger to the health of such employees, as far as may be reasonably consistent with the manufacturing process, and the fixtures and tools employed in any such process or manufacture, shall be thoroughly washed and cleaned at reasonable intervals.

10. All hoppers or chutes or similar devices used in the course of any process or manufacture referred to in section 2 of this act shall, where practicable, be provided with a hood or covering, and an adequate and sufficient apparatus or other proper device for the purpose of drawing away from the employees noxious, poisonous or injurious dusts, and preventing the employees from coming into unnecessary contact therewith; and all conveyances or receptacles used for the transportation about or the storage in any place where any such process or manufacture referred to in section 2 of this act is carried on, shall be properly covered or dampened in such way as to protect the health of the employees, and no refuse of a dangerous character incident to the work or process carried on in any such

place shall be allowed to unnecessarily accumulate on the floors thereof.

11. It shall be the duty of the State Department of Factory Inspection to enforce the provisions of this act and to prosecute all violations of the same before any magistrate or any court of competent jurisdiction in this state, and for that purpose such department and its inspectors are empowered to visit and inspect at all reasonable times all places of employment covered by the provisions of this act. In the enforcement of the provisions hereof the Department of Factory Inspection shall give proper notice in regard to any violation of this act to any employer of labor violating it, and directing the installment of any approved device, means or method reasonably necessary, in his judgment, to protect the health of the employes therein, and such notice shall be written or printed and shall be signed officially by the Chief State Factory Inspector or the Assistant Chief State Factory Inspector, and said notice may be served by delivering the same to the person upon whom service is to be had, or by leaving at his usual place of abode or business an exact copy thereof, or by sending a copy thereof to such person by registered mail, and upon receipt of such notice calling the attention of the employer to such violation, he shall immediately comply with all the provisions of this act.

12. If any occupational or industrial disease or illness or any disease or illness peculiar to the work or process carried on shall be found in any place of employment in this state by the inspectors of the State Department of Factory Inspection, or called to their attention by the State Board of Health, which disease or illness shall be caused in whole or in part, in the opinion of the inspector, by a disregard by the employer of the provisions of this act, or a failure on the part of the employer to adopt reasonable appliances, devices, means or methods which are known to be reasonably adequate and sufficient to prevent the contraction or continuation of any such disease or illness, it shall be the duty of the Department of Factory Inspection to immediately notify the employer in such place of employment, in the manner provided in section 11 of this act, to install adequate and approved appliances, devices, means or methods to prevent the contracting and continuance of any such disease or illness and to comply with all the provisions of this act.

13. For the purpose of disseminating a general knowledge of the provisions of this act and of the dangers to the health of employes in any work or process covered by the provisions of this act, the employer shall post in a conspicuous place in every room or apartment in which any such work or process is carried on, appropriate notices of the known dangers to the health of any such employes arising from such work or process, and simple instructions as to any known means of avoiding, so far as possible, the injurious consequences thereof, and the Chief State Factory Inspector shall, upon request, have prepared a notice covering the salient features of this act, and furnish a reasonable number of copies thereof to employers in this state, covered by the provisions of this act, which notice shall be posted by every such employer in a conspicuous place in every room or apart-

ment in such place of employment. The notices required by this section shall be printed on cardboard of suitable character and the type used shall be such as to make them easily legible, and in addition to English they shall be printed in such other language or languages as may be necessary to make them intelligible to the employes.

14. Any person, firm or corporation who shall, personally or through any agent, violate any of the provisions of this act, or who omits or fails to comply with any of its requirements, or who obstructs or interferes with any examination or investigation being made by the State Department of Factory Inspection in accordance with the provisions of this act, or any employe who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor and on conviction thereof shall be punished for the first offense by a fine of not less than ten dollars (\$10.00) or more than one hundred dollars (\$100.00), and upon conviction of the second or subsequent offenses, shall be fined not less than fifty dollars (\$50.00) or more than two hundred dollars (\$200.00), and in each case shall stand committed until such fine and costs are paid, unless otherwise discharged by due process of law.

15. For any injury to the health of any employe proximately caused by any wilful violation of this act or wilful failure to comply with any of its provisions, a right of action shall accrue to the party whose health has been so injured, for any direct damages sustained thereby; and in case of the loss of life by reason of such wilful violation or wilful failure as aforesaid, a right of action shall accrue to the widow of such deceased person, his lineal heirs or adopted children, or to any other person or persons who were, before such loss of life, dependent for support upon such deceased person, for a like recovery of damages for the injury sustained by reason of such loss of life, not to exceed the sum of ten thousand dollars: Provided, that every such action for damages in case of death shall be commenced within one year after the death of such employe.

16. The invalidity of any portion of this act shall not affect the validity of any other portion thereof which can be given effect without such invalid part.

Approved May 26, 1911.

In force July 1, 1911.

Compensation for the Loss of an Eye.

In addition to the usual compensation for injuries, sickness, etc., the loss of an eye is estimated as follows:

For the loss of the sight of an eye, fifty per centum of the average weekly wage during one hundred weeks.

The following 16 states have passed some kind of legislation concerning the abolishment of the "Common Towel:" District of Columbia, Colorado, Indiana, Louisiana, Missouri, Pennsylvania, Vermont, Wisconsin, Virginia, South Carolina, Maine, Massachusetts, Idaho, Washington, New Hampshire and New York.

The following 14 states have some kind of law concerning the adequate lighting of shops: District of Columbia, Connecticut,

Kansas, Rhode Island, Louisiana, Missouri, Pennsylvania, Michigan, Vermont, Wisconsin, Tennessee, Ohio, Massachusetts and New York.

The following 22 states have passed some kind of legislation concerning safety devices, the care of machinery, etc.: Connecticut, Kansas, Rhode Island, Colorado, Oregon, Indiana, Missouri, Pennsylvania, Michigan, Vermont, Wisconsin, Tennessee, Minnesota, Iowa, Ohio, Kentucky, Virginia, Massachusetts, Montana, Washington, New York and Illinois.

The following 7 states have laws concerning compensation for ocular injuries: Colorado, Indiana, Wisconsin, Nevada, Montana, New York and Illinois.

The following 11 states have some kind of legislation concerning the poisoning of workmen by the inhalation or absorption of chemicals: Missouri, Pennsylvania, Michigan, Wisconsin, Minnesota, Ohio, Maine, Massachusetts, California, New York and Illinois.

7 W. Madison St.

Abstracts From Recent Ophthalmic Literature

ANOMALIES

THE HEREDITARY TRANSMISSION OF DEGENERACY AND DEFORMITIES BY THE DESCENDANTS OF ALCOHOLIZED MAMMALS.—STOCKARD, CHARLES R., New York (*Interstate Med. Jour.*, June, 1916). In this most interesting and illuminating article Stockard gives the result of experiments which have extended over a period of several years under conditions of scientific accuracy. Breeding of alcoholized animals was carried on through several generations. The defect caused by the alcohol treatment seemed to be largely confined to the central nervous system and organs of special sense. Paralyzed limbs are often observed and the eye is peculiarly sensitive presenting in the various descendants of alcoholized individuals all degrees of degeneration—opaque cornea, cataract, small defective eyes, complete absence of one eye and finally complete absence of both eyeballs—anophthalmic monsters. In the latter case the extrinsic eye muscles, the third, fourth and sixth nerves, the lachrymal glands and other structures of the orbit are present, though the eyeball is completely wanting. Not only are the above congenital eye defects present, but in several instances members of the alcoholic lines have become blind during the first year or year and a half after birth, whereas in the control this has never occurred. The author had previously shown that similar eye conditions were obtained in great numbers by directly treating the eggs of fish with solutions of alcohol, and by treating hens' eggs with alcohol fumes either before or during incubation. J. M. W.

THE CRANIAL DEFORMITY OF ONYCEPHALY; ITS OPERATIVE TREATMENT, WITH A REPORT OF CASES.—SHARPE, WILLIAM, New York (*Am. Journ. Med. Sciences*, June 1916). Most of the observations of this condition have been made by oculists, since the patients have been brought to them on account of the failing eyesight and nystagmus; frequently the cranial deformity has been overlooked. Von Graefe reported the first case in 1866 in an eight-year-old child, who had typical choked discs. Since then about 80 cases have been reported. The cranial deformity is usually not considered important enough to warrant a doctor's opinion, unless there is impairment of the vision, and it has been observed that the greater the deformity, the greater the eye disturbance. A premature synostosis of the occipital, parietal and temporal bones has

been ascribed as the probable cause of this condition. The union of these bones has allowed brain expansion only in the direction of the anterior part of the skull, producing either the high turmschädel type, or in severe cases, the bulging prominence at the anterior fontanelle of the oxycephalic type; the resulting increase in the intracranial pressure producing choked disc and subsequent optic atrophy. In these cases the intelligence is not impaired. As possible mild types of turmschädel, Patry cites, as examples, the skulls of Sir Walter Scott, Paracelus, William Humboldt, Mechel and others who had abnormally tall heads and who were exceptionally intelligent men. The three cardinal signs are (1) the type of cranial deformity (2) exophthalmos with divergent strabismus (3) impairment of vision. The author says that the exophthalmos is undoubtedly due to the very shallow orbit. The impairment of vision is always the result of secondary optic atrophy, and it is present in practically all of the cases. The author advocates unilateral or bilateral subtemporal decompressions to relieve the pressure within the cranium and so avoid papilloedema and secondary optic atrophy. Full case reports are given of patients on whom the writer operated.

J. M. W.

PERSISTENT PUPILLARY MEMBRANE WITH PULSATING BLOOD VESSELS.—KÖLLMER, H. (From the eye clinic of Prof. K. Wessely in the University of Würzburg. *Arch. f. Aug.*, 80, p. 245). While the right eye of a woman, aged 53, was perfectly normal, K. saw on focal illumination in the center of the pupil a thin, bluish white, irregularly shaped, membrane from which threads extended in typical fashion to the arcades at the region of the small circle of the iris, which markedly projected over the pupillary portion of the bluish grey iris. In two of the lower strands a red blood vessel in the whole extent of each could be seen with the binocular loupe of Zeiss. Both strands showed jerky movements synchronous with the pulse, while the other parts of the pupillary membrane remained at perfect rest.

The case furnished an interesting observation on the action of eserine on the blood vessels of the eye, corroborating the experimental investigations of Wessely on the eyes of rabbits, who found that eserine contracts the superficial vessels of the conjunctiva and cornea and dilates very much the blood vessels in the interior of the eye. In consequence of this hyperemia the composition of the aqueous is changed and the intraocular tension increased, as also several times observed in chronic glaucoma.

After instillation of two drops of a 1% solution of eserine the red vessels in the strands were not only more marked, but were visible to a much larger extent. They did not form a loop, but both crossed the pupillary membrane to the trabeculae at the upper half of the iris. Also in almost all other, previously apparently avascular, threads of insertion of the membrane now red blood vessels had emerged. This hyperemia had not changed after four minutes, when the observation was discontinued. The pulsation was now not visible, probably because the threads of insertion were relaxed owing to the miosis.

K. recommends the eserine experiment for other cases of persistent pupillary membrane. Then possibly vessels filled with blood will be discovered, which without artificial hyperemia might as heretofore escape observation, even under strong loupes. Perhaps it may be found, that the preservation of blood circulation plays an important rôle in the persistency of the pupillary membrane. A colored plate illustrates the condition. C. Z.

A CASE OF PERSISTENT PUPILLARY MEMBRANE WITH REMARKS ON THE COLOBOMA QUESTION.—WOLFRUM. (From the eye clinic of Prof. H. Sattler in the University of Leipzig. *von Graefe's Arch. f. Ophth.*, 90, p. 471). A girl, aged 9, presented in the upper half of the right eye a pupillary membrane of rare completeness. The pupillary area was displaced upwards, so that the lower half of the iris was almost three times as wide as the upper. The pupil was not round in consequence of the traction, exerted on the iris by the pupillary membrane and its adnexes. The lower portion of the iris reacted promptly to light, while the upper portion was firmly adherent to the membrane. From the upper margin of the capsule three strands arose, which under indentation of the stroma of the iris extended to the periphery and seemed to disappear at the region of the sinus of the anterior chamber. Then they became almost transparent, while at their origin they were covered with pigment; the membrane itself was intensely white. In the whole pupillary area the sphincter and dilatator muscles were well developed. There were no signs of microphthalmos. Details of the fundus could not be ascertained, because the fine fissure at the lower pupillary margin did not permit of a sufficient ophthalmoscopic view. V 6/60, corresponding to the optical conditions. The pupillary membrane had a vacuolar aspect and was of fibrillar structure. There were no indications of an inflammatory origin, and W. attributes the condition to an arrest of development at a very early period of intrauterine life, previous to the formation of the

anterior chamber. The strands were remnants of those early blood vessels which in the indentations of the secondary ocular vesicle course outwards. They caused the dislocation of the pupil upwards and the narrowing of the upper portion of the iris. The question, why these mesodermal strands to which the formation of colobomas is generally attributed did not produce colobomas in this case, is answered by the author that the assumption of mesodermal structures are not sufficient for the development of colobomas of the iris at typical points. He surmises that the proton for the formation of the stroma of the iris partially vanished with the resorption of the pupillary membrane, and that the atypical colobomas are merely due to a defect of formation.

C. Z.

ABNORMAL SMALLNESS AND GLOBULAR FORM OF THE LENS IN A SISTER AND BROTHER OF TWO FAMILIES.—FLEISCHER, BRUNO (From the eye clinic of Prof. A. von Schleich in the University of Tübingen. *Archiv. f. Aug.*, 80, p. 248), reports the clinical histories of four cases. All showed an abnormal size and form of the lens due to a disproportion of the equatorial and sagittal diameters, causing myopia of from 9 to 12D. Other clinical phenomena were: Shallow anterior chamber (from .2 to 1.4 mm. depth), tremulous iris and lens, abnormal visibility of the fundus beyond the ciliary processes, with normal posterior pole, early appearance of glaucoma, necessitating trephining and in some extraction of the lens. The lens very much resembled the globular form of the embryonic lens. The occurrence in children of the same families pointed to a congenital hereditary anomaly. An abnormal length and relaxation of the zonula Zinnii might explain, that the lens developed without the flattening influence of the zonula, and also the tremulousness of the lens, but the examination with the loupe did not confirm this. The micro- and globophakia may be related to ectopia of the lens, as by possible defects of the zonula Zinnii displacements of the lens might occur. So far the anomaly has not been described.

C. Z.

CIRCULATION

THE RETINAL CIRCULATION IN ARTERIO-SCLEROSIS.—MOORE, FOSTER, London (*Report of the 1916 Congress, Ophth. Soc. United Kingdom, Brit. Med. Journ.*, May 13, 1916). The writer argued that high pressure in the large arteries was the result of obstruction to the flow in the small vessels, and that therefore the pressure in the retinal arteries might be subnormal, whilst that in the brach-

ial artery was 250 mm. Hg, or higher. The chief evidence in favor of this view was based on two series of observations: (1) That in some cases of arterio-sclerosis a very light pressure on the eyeball was sufficient to produce arterial pulsation, showing that the diastolic pressure in the retinal artery was but slightly above the intraocular pressure, which might be taken as 20 mm. Hg; (2) that whilst the intraocular pressure in arterio-sclerosis, as in health, varied directly with the local pressure in the vessels of the eye, yet it was not raised in arterio-sclerosis. Mr. Foster Moore believed that his observations on the eye were true of the brain and other tissues of the body, and argued that vigorous measures carried out for lowering the blood pressure in such cases, were likely further to deplete the already curtailed blood supply to the tissues, and thus be harmful rather than beneficial. C. H. M.

CORNEA

ON CHANGES OF THE CENTER OF THE CORNEA IN CONGENITAL OPACITIES OF THE CORNEA.—SCHOMANN, H. (From the eye clinic of Prof. A. Peters in the University of Rostock. *Klin. Mon. f. Aug.*, 55, p. 532), reports a case of slight buphthalmus with dense opacities of the cornea of both eyes of a boy, aged 24 weeks. Sclerotomy was performed in both eyes. Two months later a small paracentral defect had developed in the left cornea. The defect appeared dark and proved that the ulcer had reached the deepest parts of the cornea. As inflammatory symptoms were never observed, the development of the ulcer could only be interpreted by the assumption of a cystoid cavity in the cornea, the epithelial covering of which had sloughed. This is in concordance with anatomical observations of Mohr, Seefelder, Wintersteiner, and others, which are quoted.

Then the anatomical and microscopical descriptions of a cystoid ectasia of the cornea in a microphthalmic eye of a rabbit, aged four weeks, is given. There was also a duplication of the retina, and the ciliary muscle and the iris were lacking which certainly was due to a developmental disturbance, especially as the intactness of the well developed ciliary processes spoke against an inflammatory cause. The lacking of the ciliary muscle and partial thinning of the sclera of the other eye corroborated this view. It was further strengthened by the fact that another rabbit of the same litter showed in both eyes congenital opacities of the cornea and a cystoid prominence of one cornea, which are described in detail. The occurrence of these similar changes in two rabbits of the same litter

spoke for a hereditary malformation, as it is well known of the congenital opacities of the cornea and staphylomas of the human eye.

The only clinically observed case is considered by the author as a result of a disturbance of development, supporting the recent hypothesis of Peters and Wirths with regard to the formation of the congenital opacities of the cornea and staphylomas, viz., that the indentations and circumscribed ectasiæ are due to a deficient or lacking separation of the lenticular vesicle with consequent defects of Descemet's membrane.

C. Z.

GLAUCOMA

THE EVOLUTION OF THE FILTRATION OPERATION FOR GLAUCOMA.—REBER, WENDELL, Philadelphia (*Jour. Ophthalm., Otol. and Laryngol.*, May, 1916). DeWecker as early as 1867 suspected that a cicatrix that filtered sometimes occurred after anterior sclerotomy. It was Herbert who made the first real advance by doing an anterior sclerotomy and twiddled or rotated the narrow knife blade in the wound before withdrawing it. His hope was to create a ragged state of the wound at the point of puncture and counter-puncture and thus promote fistular healing. To make filtration more certain he cut on upward and left a bridge of scleral tissue about 5 mm. wide which was then cut through under the conjunctiva by turning the knife abruptly forward.

Lagrange excised a small piece of scleral tissue from the upper edge of the wound. Argyll-Robertson, Strawbridge and Froelich all trephined the sclera, but it remained for Elliot to perfect the operation and drain the anterior chamber under the conjunctiva. Holth developed his punch operation and Borthen his operation of iridotaxis, which consists of deliberate incarceration of the iris in the wound. He discusses the danger of late infections in these various operations and regards it as one of the possibilities in all filtration operations, and believes that when such an operation is performed that the patient should be warned of that danger and the necessity of having the eye kept under observation for a life time.

M. B.

PATHOLOGY OF GLAUCOMA.—MACKENZIE, G. W., and NAGLE, F. O., Philadelphia (*Jour. Ophthalm., Otol. and Laryngol.*, May, 1916). This very elaborate article is well illustrated throughout with wood cuts of microscopic changes of the uveal tract and the excreting angle in glaucomatous eyes. The article deals largely with the his-

tory of the pathology of glaucoma and must be read in the original as it does not lend itself well for review. M. B.

CLASSIFICATION OF GLAUCOMA.—HALLETT, DE WAYNE, New York (*Jour. Ophthalm., Otol. and Laryngol.*, May, 1916). He accepts the classification of Leber, Knies and Weber of primary and secondary, and divides the primary into, simple, subacute and acute. He puts buphthalmus under the glaucoma heading as a juvenile glaucoma simplex. M. B.

THEORIES OF GLAUCOMA CAUSATION.—ROWLAND, W. D., Asbury Park, N. J. (*Jour. Ophthalm., Otol. and Laryngol.*, May, 1916). This paper consists in a brief statement of all the various theories of the causation of glaucoma and does not lend itself well for review. M. B.

BLOOD PRESSURE IN GLAUCOMA.—MACMULLEN, F. B., Detroit (*Jour. Ophthalm., Otol. and Laryngol.*, May, 1916). Experiments upon animals by several observers agree that the intraocular pressure rises with the general blood pressure. There is a diversity of opinion with regard to its etiological import in glaucoma but the majority do not look upon high blood pressure as essential to glaucoma. M. B.

TREPHINING VERSUS IRIDECTOMY IN GLAUCOMA.—WOODRUFF, H. W., Joliet (*Annals of Ophth.*, Jan., 1916, p. 1). After briefly reviewing the history of operations for glaucoma, the author says that the favorable reception of the trephine operation is due to (1) its merits (2) its freedom from technical difficulty of performance (3) Colonel Elliot's demonstrations. Elliot said, "There are only two forms of glaucoma in which I hesitate to advise trephining. These are: First, glaucoma secondary to cataract associated with a fluid or semi-fluid opaque lens, and second, conditions (traumatic) in which there is known to be a free communication between the aqueous and vitreous chambers. If these two be set aside, there is no form of glaucoma, from the very chronic to the most acute, which cannot, and in my opinion should not, be treated with the trephine." The Elliot operation naturally is effective in lowering the tension. The author believes that iridectomy is still the operation of choice for glaucoma, and trephining and other methods of extra-ocular drainage are operations of necessity. It is extremely doubtful if 50 years hence, it will maintain

its position so well as iridectomy has done. The trephine operation includes a small peripheral iridectomy which is no doubt in itself beneficial in many cases and will explain the relief of tension in those cases in which the fistula closes and extra-ocular drainage becomes occluded. In these cases the iris is excised near its root, which is most effective in securing intra-ocular drainage.

The principal indictments against iridectomy are difficult technique, corneal astigmatism, and failure to reduce tension. The charges against trephining are hypotony, late infection and iritis. In acute inflammatory glaucoma, and in most cases of the subacute variety, a properly performed iridectomy gives immediate and permanent relief. Cases in which structural changes are far advanced, the iris atrophic, the vascular system sclerosed and the cribriform ligament atrophic are suitable for the trephine operation. Iridectomy, in glaucoma simplex, produced definite cures in rather more than half of the cases; in one quarter of the cases relapses occurred, which were cured only by a second iridectomy, while in the rest of the cases, blindness set in in spite of the operation. Iridectomy is indicated in annular synechia. The secondary glaucoma which follows cataract operation due to adhesions of the angles of the cut iris have been relieved by iridectomies in these locations. Colonel Elliot's indications for the trephine operation should be narrowed to cases in which iridectomy has failed, to congenital glaucomas, to glaucomas secondary to cataract extraction which do not show on examination with the loupe any anterior synechia or membrane in the wound or pupillary area. More time and the experience which goes with it will still further assist in making a correct comparison of these two important operations. The author suggests in conclusion a careful study of the individual case, using the operation of iridectomy where there is a reasonable chance of success, and resorting to the trephine only in case of necessity.

J. M. W.

RESULTS OBTAINED BY THE FOX MODIFICATION OF THE ELLIOT OPERATION FOR GLAUCOMA.—FOX, L. WEBSTER, Philadelphia (*Jour. Ophthalm., Otol. and Laryngol.*, May, 1916). The major part of this paper deals with the history of operations for glaucoma from the time of iridectomy down to the present. The author's modification of Elliot's operation is largely in the way he makes his conjunctival flap. His is the sliding flap of Van Lint as used after cataract extraction. Fox has performed a large number of trephinings and covered them with this flap, "excellent results."

He has been "exceptionally fortunate" as regards late infections and attributes this to the care with which pyorrhea alveolaris has been guarded against. M. B.

INJURIES

EXTRACTION OF PIECES OF COPPER WITH A TELEPHONE FORCEPS.—WEVE, H. (From the eye clinic of Prof. C. von Hess in the University of München. *Arch. f. Aug.*, 80, p. 259). As the presence of pieces of copper in the interior of the eye will by their toxic influence without fail destroy sight and the number of injuries by copper in the present war has been considerable, any means of facilitating the extraction of non-magnetic metallic foreign bodies will be welcomed. This led the author to the construction of a telephone forceps which is described. It is based on the principle of Benn-Kaufmann, that the human body which is to be considered as a weak solution of sodium chloride, forms in contact with two different metals an element, the opening and closing of which elicits noises in a sensitive telephone. The forceps, manufactured by Frohnhauser, München, consists of steel, copper plated, except at the points and inner surfaces of the grasping branches so that an element is only created if the hot copper plated parts touch the foreign body of copper. A short circuit is prevented by a distance of 1/20 mm. remaining between the branches if the forceps is closed. The length of the grasping ends to be introduced into the eyeball is only 2.00 cm. The other end of the forceps is by very pliable cords, united in one, connected with a telephone of 2,000 Ohm resistance. The choice of entrance must of course be determined by very accurate localization by the ophthalmoscope or Roentgen rays. The forceps has the advantage that it needs to be introduced only once.

W. reports his preceding experiments on the influence, dependent upon the size of the pieces of copper and the concentration of the salt solution on the telephonic proof. The human vitreous contains from 1.69 to 1.89% solid substances half of which consists of organic substances and especially of sodium chloride. Hence the experiments with from 0.5 to 0.9% salt solutions were of most interest. A series of pieces of copper of from 0.00 to 0.340 grams were examined. Minute pieces of copper from 0.001 to 0.002 in 0.5's salt solution were ascertainable, although faintly, in 0.9% so clearly that the method was practically useful. [We would suggest the attempt to increase the salt concentration of the vitreous by injecting a concentrated salt solution into the surroundings of

the foreign body, if the reaction was negative. Reviewer.] Pieces of copper of 0.007 were ascertainable already in 0.5% solutions. Experiments on perfectly fresh pigs' eyes entirely corresponded with W.'s expectations. The method may also be employed in other electric foreign bodies. For pieces of lead W. points out that a thin oxydized stratum entirely eliminates the telephonic noise, weak in itself.

On account of the importance of injuries by copper under the present conditions, the author did not wish to wait with the publication of his method, until he would have had a series of personal experiences on patients. C. Z.

VISUAL DISTURBANCE AFTER SHOTS OF THE OCCIPUT.—PAGEN-STECHER, A. H., Wiesbaden (*Arch. f. Aug.*, 80, p. 229), observed a number of shots of the skull with defects of the visual fields: Cases of superior and inferior hemianopsia. A man was brought in with prolapse of the brain of the size of a hen's egg after a sagittal shot through the occiput. Under pressure bandages the prolapse receded. Only a part of the right upper quadrant of the visual field was preserved, which fluctuated considerably, but always was strictly homonymous, V 6/9-6/6. Other cases which were complicated with optic neuritis, showed unequal visual fields of both eyes.

The clinical histories of two cases are reported in detail. One showed a suppurating wound of the occiput after a shot with remaining projectile, which had been removed. V 20/36, optic neuritis of both discs, which subsided, but V grew worse, especially that of right eye, and the visual fields were more contracted. The hemianopic character of the visual field of the right eye, in which the nasal half was lacking, suggested pressure by the bone upon the right hemisphere. A detached piece of the inner table was removed. The fundus was normal, the pupils reacted normally, and L V rose to 6/24, R V fing. at 3/4 m. The visual disturbances must be attributed to a lesion of the visual center.

The second patient saw after a shot into the occiput in both eyes very poorly. Although the visual field was not recorded after the injury, a right sided hemianopsia most likely existed. While V of left eye was improved, the right eye became completely blind. The ophthalmoscopic condition and pupillary reaction were normal. There was a hysterical paresis of the right foot, but all tests for hysterical symptoms on the eye failed, so that the assumption of an hysterical amaurosis seemed forced.

P. reported the cases in connection with those of Uhthoff and Axenfeld, as they, with further cases, might bring us nearer to the question on what the asymmetry of the visual fields and the difference of vision of both eyes after shot injuries of the occiput depend. C. Z.

ON GUN SHOT INJURIES OF THE TEMPORAL AND FRONTAL REGIONS AND ORBIT.—GILBERT, W., München (*Arch. f. Aug.*, 80, p. 236). Of the injuries of the skull those of the temporal and frontal regions, besides those of the occiput, are the greatest interest to the ophthalmologist. For they do not only indirectly concern the eye as most other shots of the skull, but very often, sometimes even regularly, the eye and its adnexes are also injured, and the course of the ocular injury may be influenced by the cerebral lesion. G. reports his experiences with these injuries, made at the front at sanitary companies and field hospitals, including only those he could observe from beginning to a certain termination of the treatment.

In all more extensive injuries G. found it best to open the wound wide and remove larger splinters of bone. Sometimes the method of Krönlein was necessary. Of eight injuries of the temporal region and orbit, excluding transverse shots, only one died. The eye complications were three times ruptures of retina and chorioid, twice internal hemophthalmus, once rupture of the cornea, once perforation of the cornea and neuroparalytic keratitis. In these two cases exenteration was performed.

The injuries of the frontal and fronto-orbital regions were much more serious. G. considers his cases under two groups: (1) with entrance of the projectiles at the upper temporal margin and (2) entrance and through shots at the region of the frontal sinus. The ocular complications of the 15 cases were in 6 loss of the eye through perforating injury or rupture, in 2 dislocation of the eyeball with subsequent phthisis, in 2 transient exophthalmus by orbital hemorrhages, in 1 bilateral amaurosis from destruction of the ciasm, besides tears and regularly larger ecchymoses of the lids. Fifty-three per cent of these died. C. Z.

INJURIES OF THE EYE AND ORBIT.—GRIFFITH, ARTHUR D., Malta (*The Lancet*, June 24, 1916). Ophthalmology more than other specialties presents grave problems in war—problems on the correct solution of which depend the future happiness and usefulness of the patient. Under the anatomical headings cornea, iris, lens, fundus and wounds of the globe, the author considers in some

detail the results of his experiences in treating eye conditions in the Military Hospital at Malta.

Atrophy of the optic nerve may be produced in several ways. It occurs most commonly from a fracture which runs into the optic foramen, and this may cause immediate blindness from rupture of the nerve or slow destruction of sight from the contraction of scar tissue, or from pressure of callus. Atrophy may follow division of the nerve from force or dislocation of the eye with rupture of the nerve.

The name "shock amblyopia" is applied to the diminution or loss of vision following a shock in which no structural change is produced in the eye or optic nerve. There may be a transient blindness from over-stimulation of the retinae, or blindness from closure of the lids due to hyperaesthesia of the retina, or there may be impairment of accommodation causing a latent hyperopic error to become manifest.

The author thinks that if one eye is ruptured it should be removed; and if both eyes are ruptured, as a rule they should be left. He says that he would rather remove many damaged eyes unnecessarily than allow one eye to be lost through sympathetic inflammation. The operation which he has been performing in the majority of cases is an amputation of the anterior part of the eye, leaving the longest stump which can be covered by the flap of conjunctiva.

J. M. W.

FRACTURE OF DESCMET'S MEMBRANE.—WALKER, SYDNEY JR., Chicago (*Annals of Ophthalm.*, April, 1915, p. 289). Although many cases of fracture of Descemet's membrane due to birth injuries, myopia, intra-ocular tumors, and buphthalmos have been reported, those due to direct injury from blunt objects are rare. Such fractures are usually complicated by intra-ocular hemorrhage, cataracts, etc.; it is more likely to happen in youth than in old age; it usually leaves permanent scars, but they may at times disappear. The writer described a case which he considered a case of fracture of Descemet's membrane. With oblique illumination, five nearly vertical striae, resembling cracks in ice, could be very readily seen on the posterior surface of the cornea. With the ophthalmoscope these striae were very difficult to make out. The eye became soft and the retina became detached so that the patient's vision was reduced to light perception. In this case the author considered the rupture to be due in all probability to the sudden stretching of the cornea from without inward, just the

opposite of the process which occurs when the fracture of Descemet's membrane is due to myopia, buphthalmos, etc. J. M. W.

SOME OPHTHALMIC LESSONS OF THE WAR.—JESSOP, WALTER H., London. (*Report of 1916 Congress, Ophthal. Soc. United Kingdom, Brit. Med. Journ.*, May 13, 1916.) In his inaugural address, the president referred to the results of injuries to the eye ball, stating that during the American Civil War 41 cases of sympathetic ophthalmitis occurred amongst 254 cases of destruction of the eye; that the German official returns for the war of 1870 showed that 55.6 per cent. of all cases of injury to the eye ball were followed by sympathetic ophthalmitis, and that in more than half of these cases the second eye was involved within a year of the injury. During the present war, owing to the excellent work of the ophthalmic surgeons in France and elsewhere, he had neither seen nor heard of a single case of sympathetic disease.

In dealing with the occurrence of papilloedema in relation with head injuries, he said that, as he had already shown, it was often transient and disappeared without leaving any permanent residue; this, he believed was in entire accordance with the views as to the pathology of papilloedema expressed by Leslie Paton and Gordon Holmes as a result of their excellent work.

In dealing with the retinitis which had occurred in a number of cases of trench nephritis, he expressed the opinion that it was purely toxæmic in origin, and that vascular changes were of no importance in its production. He looked upon the process as due to a severe retinal oedema, and referred to several cases under his care in which almost complete subsidence of the retinitis occurred with complete restoration of vision. The retinal changes might come on at a comparatively early date after the onset of nephritis.

C. H. M.

CONTUSION HYPOTMY.—COLLINS, E. TREACHER, London. (*Report of 1916 Congress, Ophth. Soc. United Kingdom, Med. Press*, May 17, 1916.) It was pointed out that diminution of tension after contusion of the eye, apart from any perforation of the globe, was not infrequent. In most cases normal tension was restored in a few days: in others not for several weeks, and in some it remained so long as to be likely to be permanent. The causes he discussed under the following heads: (1) Diminished secretion: divisible into (a) from nerve inhibition, (b) from vascular disturbance, (c) from epithelial damage. (2) Increased excretion, namely (a) through normal channels, (b) through newly-formed

channels. After quoting several illustrative cases he submitted the following conclusions:

(1) Hypotony following contusion of the eyeball may be due to different causes, more than one of which may be present at the same time.

(2) When of short duration it is probably due to an increased rate of excretion of the intra-ocular fluid through the expanded normal channels of exit; or, possibly, to some arrest of secretion from paresis of the vasoconstrictor nerves.

(3) When of long duration it may be due to (a) the formation of new channels of exit for the intra-ocular fluid from the anterior chamber from either an internal scleral rupture, or rupture of the pectinate ligament, (b) the cutting off of blood supply to the ciliary body from rupture of the anterior ciliary arteries, or (c) possibly the detachment of the pars ciliaris retinae.

(4) If accompanied by extensive hemorrhage into the anterior chamber, either the canal of Schlemm has been opened up by an internal scleral puncture, or the anterior ciliary arteries have been torn across from cyclodialysis.

(5) If, when the blood has been cleared away, a portion of the iris has disappeared from view, as though an iridectomy had been done, then there has been cyclodialysis with rupture of the anterior ciliary arteries.

(6) If, in the course of time, a translucent area appears just outside the sclero-corneal margin, like that seen in cystoid cicatrix, then there has been an incomplete internal rupture.

(7) If the anterior chamber, without extensive hemorrhage into it becomes markedly deepened in the whole or part of its circumference, there has probably been a rupture of the ligamentum pectinatum, limited to the pillars of the iris, and of the ciliary muscle, prolonging the angle of the anterior chamber outwards.

(8) If the lens is dislocated laterally and the retina detached, the vitreous humour has probably come forwards into the circumferential space, and may have dragged the pars ciliaris retinae away from the pigment epithelium.

C. H. M.

INSTRUMENTS AND METHODS OF EXAMINATION

IRIS

EYE RECORDS DESIGNED ESPECIALLY FOR OFFICE USE.—
SPENCER, FRANK R., Boulder, Colo. (*Ann. Ophthalm.*, April, 1916.)
The record designed is a double sheet of four pages about 9x11

in size. All four pages are filled with printed headings which are to remind the writer of the history as it is being taken not to overlook this, that and the other. M. B.

THE ADVANTAGES OF THE FISHER DOURLE LID HOOK.—LLOYD, R. I., Brooklyn. (*Jour. Ophthal. Otol. & Laryngol.*, June, 1916.) The author thinks this instrument serves to hold the lid away from the eyeball better than any other instrument. That it serves to break the action of the orbicularis and prevents the spasm of this muscle which is a calamity in the presence of cataract extraction. He thinks this hook should always be used in that operation.

M. B.

TONOMETERS AND THEIR USE IN DIAGNOSIS OF GLAUCOMA.—MCLEAN, WM., New York. (*Jour. Ophthal., Otol. and Laryngol.*, May, 1916.) Two types of tonometers have been devised, the impression type which records the amount of indentation of the cornea and the applanation type which records the amount of flattening of the eyeball to a given pressure. As early as 1863 von Graefe constructed a tonometer of the impression type. At the same time and independently, Hamer, under the direction of Prof. Donders, constructed an impression tonometer which was to be placed directly on the eyeball. The tonometers of Fick and Makaloff are good examples of the applanation type. It was not until Prof. Schiotz in 1905 brought out his instrument and was later copied by Gradle with a few modifications that the use of the tonometer became popular and the uncertainty of estimating the intraocular pressure by the fingers was fully realized. The author was impelled by certain objections that he found in these instruments to perfect one of his own. An account of which has been previously reviewed in this journal. He says: "I have constructed a tonometer of the impression type, which gives direct readings on the scale of the instrument. There is no changing of weights. The scale is placed as close to the observed eye as possible. The plunger is so fitted in the foot-plate barrel that approximately 1 mm. space separates it from the barrel, and thus all tendency to capillary attraction of fluid between the two is destroyed."

He objects to the use of cocain in the eye as an anesthetic preparatory to using the tonometer. It dilates the pupil and tends to increase intraocular tension. Holocain does not have these objections. He has known of two cases of acute glaucoma to follow use of cocain in the eye. It is essential that the instrument be placed

squarély on the center of the cornea, with the long axis continuous with the anterior pole of the eye. The instrument should not be tipped for more than 5° . One good reading is to be preferred to several uncertain ones. He believes that one of the most valuable uses of the tonometer is the information it gives in the medical treatment of non-surgical cases.

M. B.

A CORNEAL SPATULA: AN INSTRUMENT FOR USE IN REMOVAL OF DEEP-LYING FOREIGN BODIES IN THE CORNEA.—USHER, C. H., Aberdeen, Scotland. (*The Ophth. Review*, Jan., 1916.) The instrument is intended for cases of foreign body that lie so deeply imbedded in the cornea that there is risk during their extraction of pushing them into the anterior chamber unless some form of guard or support is placed against the posterior surface of the cornea. The keratome or broad needle generally used for this purpose has the disadvantage that its flat blade does not come in contact with the posterior surface of the cornea so that a space is left in this situation.

The spatula described consists of a blade, a neck and a handle. The blade is circular with a diameter of 6 mm., its anterior surface convex with a curvature corresponding to that of the posterior surface of the cornea; its posterior surface is flat and its edge blunt and smooth. The neck is 2 mm. in length. The handle set at an angle of 125° with the neck and blade, allows the blade to be conveniently introduced at the nasal edge of the cornea when necessary.

The blade is introduced through an incision made with an ordinary keratome at the limbus. The advantages claimed for the instrument are that it is more likely to prevent a foreign body entering the anterior chamber during the manipulations for its extraction from the cornea and, as the blade is blunt, it is less liable to cause damage, especially when aqueous has escaped, during any movement of the eye in a restless patient, than a blade with a sharp point and edges, thus giving the operator more freedom to concentrate his attention on the actual removal of the foreign body.

C. H. M.

EYE SPECULA: THREE NEW DESIGNS.—EWING, A. E., St. Louis, Mo. (*The Amer. Jour. Ophth.*, February, 1916.) The writer presents an exhaustive and interesting paper on the subject of eye specula tracing the development and evolution of instruments of this sort from ancient times to the present and giving numerous illustrations of every form hitherto described.

He considers that the great number of specula advocated is evidence that the ideal lid elevator has not yet been discovered. He finds the bar types are objectionable because of the difficulty of their introduction as well as removal, and the spring types because of the necessity of pulling down the lower lid or raising the upper lid in order to remove them. For a number of years he relied mainly on the fingers of an expert assistant for all dangerous operations on the globe, but lately, failing in such expert assistance, he invented three new designs or rather one new one evolved from two preceding models. The first model was unsatisfactory and need not be described.

The second model was a combination of the spring and friction types of specula, constructed by hinging a spring to the carriers; one of the latter is fixed to one end of a bar, the other end of which glides freely but snugly through a tube or canula in the fellow carrier. When the elevators are fixed in position by the set-screws as widely apart as may be required they may be brought together by moderate pressure on the spring at the hand holds. After introduction between the eyelids the spring is released and the speculum is in place. Its removal may be effected in two ways. The blades may instantly be brought together by pressure on the spring as the hand holds near the bar, and the removal effected in the usual manner, or the set-screw of the upper lid blade may be released and this blade may be easily slipped from beneath the lid, and at the same time it may be kept away from the wound by lifting the lid a little forward with it as it is withdrawn. This last is to me the method most preferred.

In the third design the handles, set-screws and grooves are omitted, and the arms bearing the blades are connected directly to the springs by the hinge; a check in the form of a nut is added to the free end of the bar to control the width to which the arms may open. For cataract operations model II is preferred.

C. H. M.

THE DIFFERENTIAL PUPILLOSCOPE: A METHOD OF MEASURING THE DISTURBANCES OF PUPILLARY REACTION... HESS, C., München. (*Archiv. f. Aug.*, 80, p. 213), developed methods by which disturbances of the pupillary reaction can not only be proven, but also measured in degree. For that purpose he constructed his differential pupilloscope, which is described. With this one can find the smallest differences of intensities of light, which during exposure of the eye to permanently acting, but differently intense, lights are able to cause a just noticeable change of the width of the pupil.

Thus the differential threshold or the pupillo-motor differential sensibility is determined not the threshold of excitation, which practically cannot be examined as on account of the required low intensities of light the pupillary reaction cannot be sufficiently well observed.

By former investigations H. showed that the motor, as well as the optical, receiving apparatus of our retina is localized in the outer members of the visual epithelia. The processes, elicited by the light in the same receiving organs and leading to the perception of light, are in close connection with changes producing the pupillary reaction, but, as H. showed, both processes are not to be regarded identical. Hess proved this by the discovery that only a relatively small circumfoveal area is motorically excitable and that the motor excitability rapidly decreases from the fovea toward the periphery, while also on relatively peripheral places of the retina colorless stimulating lights appear equally light in the light adapted eye and even lighter in the dark adapted eye than in the center of the fovea. H. also showed that the contraction of the pupil upon illumination of far eccentric parts of the retina is due to the excitation of the central parts of the light, diffused in the eye.

The activity of the pupillary reaction does not run parallel with the visual acuity, as H. emphasized before. The pupillo-scope examination demonstrates that, if vision is reduced to counting fingers by dioptric disturbances, opacities of the media, cataract, there may be normal motor differential sensibility. Thus from normal motor differential sensibility of an eye, affected with cataract, normal function of the fovea may be inferred with great probability. So far means had been searched for in vain to ascertain this.

H. found with the pupillo-scope that the smallest differences of intensities of light, which in normal youthful eyes elicit marked contraction of the pupil suffice also in senile eyes for contracting the pupil. He thus proved that the senile decrease of pupillary contraction is due to mechanical causes, apparently to the diminished elasticity of the tissue of the iris at higher age.

In tabes and paresis measuring of the disturbances of the pupillary reaction may be of great value with regard to diagnosis and perhaps also therapy before the onset of reflex iridoplegia. By the pupillo-scope examination it was possible in a large number of cases to decide whether the optical or nervous portion of the visual organ was the seat of the disease.

A case of megalophthalmus of the right eye with complete amaurosis of this eye since childhood, but normal fundus, is reported, in which the pupilloscope revealed normal motor differential sensibility. Here for the first time the proof was given that in a perfectly blind eye the pupillary reaction to colorless and colored lights was exactly the same as in normal eyes. This observation does, according to H., not support the assumption of special pupillary fibers. Possibly the motor and the optical excitations, occurring in one visual element, may be conducted to the central organ by the same fiber. If only the motor receiver, not the optical receiver, has been developed in the visual elements, the occurrence of pupillary reaction in blind eyes is easily conceivable.

C. Z.

LACRIMAL APPARATUS.

EXPERIMENTS ON THE CONVECTION OF THE TEARS. ROCHAT, G. F., AND BENJAMINS, C. E. (From the Physiological Institute in the University of Utrecht. *Von Graefe's Arch. f. Ophth.*, 91, p. 92), concluded from their anatomical researches on the tear passages of the rabbit, reviewed in this number of Ophthalmology, that the mechanism of the convection of the tears consists in muscular compression of the canaliculus, and found this assumption corroborated by their physiological experiments, which are reported in detail. Into the lower end of the lacrimal duct, laid free from the mouth, a bent canula was inserted. The upper lid was connected by a thread with the short arm of a lever which registered the short contractions of the lid, elicited by the inductive current, simultaneously with the fluctuations of the level of fluid in the canula, connected with the tear duct.

The same experiments were made in a patient with a lacrimal fistula and another person who had an inner fistula after a successful operation according to West-Polyak. To each contraction of the lid corresponded a rise of the fluid level. Thus in man and rabbit Arlt's theory has been proven that the pressure in the tear sac is increased by the contraction of the lids.

C. Z.

REMARKS ON THE ANATOMY OF THE LACRIMAL PASSAGES OF THE RABBIT. ROCHAT, G. F. AND BENJAMINS, C. E. (From the laboratory of the eye clinic in the University of Utrecht. *Von Graefe's Arch. f. Ophth.*, 91, p. 66), describe their anatomical studies on the tear passages, gained from sections of the decalcinated head of the rabbit. Three muscles are in indirect or immediate connection with the lacrimal duct. The most important is the

Zygomatico-lacrimal, arising from the nasal ocular angle at the margin of the Zygomatic bone, extending vertically upward to the skin of the skull and covering the nasal portion of the canaliculus. A bundle of the orbicularis covers the Zygomatico-lacrimal in horizontal direction. The third, probably the prorector of the third lid, arises at a bony hook at the entrance of the osseous lacrimal canal and extends as a thin wide band in the upper portion of the third lid. All exert a compression on the canaliculus.

The lacrimal duct of the rabbit compared with the human shows also these differences: The rabbit has only one canaliculus, viz., in the lower lid. This is the largest part of the whole duct, its volume surpassing all remaining parts. The anterior opening lies far in front near the nostril, not under the lower concha. There are no valves, but the regurgitation of tears is prevented by the fine terminal fissure in the nose and the fine fissure by which the attenuating canaliculus ends in the lacrimal duct. The upper blind end of the duct is comparable to the human fundus sacci lacrimalis, partly to the upper canaliculus. For the purpose of physiological experiments the tear duct can be easily exposed to a large extent from the oral cavity.

C. Z.

MATERIA MEDICA AND THERAPEUTICS

THE INTERNAL SECRETORY SYSTEM IN OPHTHALMOLOGY, WITH SPECIAL REFERENCE TO GOITER.—LAMB, ROBERT SCOTT, Washington, D. C. (*Ann. Ophthal.*, April, 1916.) The author presents a symptom picture of dilated and frequently unequal pupils, chorioretinitis and attacks of severe headache which he believes are responsible to an excess of secretion from the thyroid, thymus and adrenal glands. He thinks these symptoms can be explained by oversensitization of the tissues by the thyroid hypersecretion appearing in the blood, and in the presence of adrenalin chlorid producing a very definite excitation to the sympathetic nerve endings or "plates of Langley."

After a period of overexcitation and stimulation there is, of necessity, a fatigue and some of the eye signs are those of fatigue, such as lack of convergence, exophoria and asthenopia, or ciliary congestion of episcleral vessels.

As to chorioretinitis, the author has been a little in doubt as to its being due to some direct effect of the adrenalin on the pigment cells, or whether it was due to exposure, because of dilatation of the pupil over a long period of time, or both. He is satisfied that in some of the fatigue cases there is intraocular tension; the exoph-

thalmus is undoubtedly a late manifestation, as is also the tremor of the lids. In these cases of tremor the pupils are never so widely dilated because the stimulation is evidently of a craniosacral character rather than sympathetic.

As to headache, which is an early symptom, it is characteristic. In its milder form it occupies the region of the temples, eyeballs, and extends toward the top of the head. Besides the heaviness there is excruciating pain. The more severe type, which is usual, is that in which the pain extends on over the vertex and down the nape of the neck into the shoulders. The characteristic feature is its occurrence within a few minutes of any shock, stress, strain or prolonged overexertion, and continues day and night until treated by sedatives or hypnotics, or until rest in bed and freedom from further excitation wears out the stimulating endocrin substance. He finds he can get control of it rather well with pilocarpin and dionin but is not prepared to explain its cause.

He believes it important that the oculist should have his suspicions aroused in these cases that they are early signs of disturbance of thyroïdal and other glandular secretions. M. B.

THE VALUE OF THE SPARK FROM HIGH FREQUENCY MACHINES.—RICE, PHILLIP, San Francisco. (*Jour. Ophthal. Otol. & Laryngol.*, June, 1916.) The author invested in a high frequency machine six years ago and has found it of value in a number of trying conditions. He reports the cure of a case of very aggravated vernal conjunctivitis of so long standing and so aggravated that the corneal pannus was equal to that of trachoma. Just how he used the current is not quite clear. He speaks of trying the spark on the fungi of the lid. Improvement began at once. The pannus cleared up entirely, vision became normal, and though it required weekly treatments for two years the result was perfect. M. B.

PLANTANUS OCCIDENTALIS. A REPORT OF FIVE CASES.—WILLIAMS, W. H., Middleton,, Ohio. (*Jour. Ophthal., Otol. and LARYNGOL.*, March, 1916.) This drug is given internally in from one to three drop doses about two or three times daily for the absorption of chalazion. He reports five cases, two in young children and three in adults. The chalazia in the children disappeared after the drug had been used for several months. In adults its use had apparently but little if any effect. M. B.

MASSIVE SUBCONJUNCTIVAL INJECTIONS OF CYANID OF MERCURY IN DANGEROUSLY INJURED OR INFECTED EYES.—JONES, E. L., Cumberland. (*Annals of Ophth.*, April, 1916, p. 280.) It is not

any particular chemical subconjunctival injection that is of importance, but the process of exciting a maximum normal physiologic action enables nature to accomplish the resistance of disease or injury, which she could not accomplish unaided. The formula which has been mostly used for injection is two cubic centimeters of 1-1500 cyanid of mercury, in which is dissolved about one-eighth grain each of aconin, morphin sulphate, dionin, boric acid and a little salt. The eye should be cocaineized very thoroughly for a longer time than usual in operations, and then the injection will cause pain very seldom lasting over fifteen minutes in an eye previously not painful. If conditions already painful, as iritis or iridocyclitis, exist, one-quarter grain of morphin may be used. Children are given as large injections as adults. The lymph channels are flushed by the increased lymph flow, and the nutrition of various structures is increased. In penetrating wounds of the globe and peripheral ulcers of the cornea, the swollen conjunctiva also covers the wounds, and protects against external contaminations and conjunctival secretions. The swelling of the conjunctiva usually leaves the center of the cornea exposed, but in some cases that also is covered. If a central corneal ulcer exists, an immediate injection is advised to check it at once. The injection should be made within a few hours after a penetrating wound, or it will be too late to prevent degenerative changes in the vitreous. After all operations for the removal of foreign bodies from the vitreous, an injection can be made to safeguard the eye from infection.

J. M. W

MUSCLES

ON MOVEMENTS OF THE UPPER LID. ACCOMPANYING NYSTAGMUS OF THE EYEBALL. (NYSTAGMUS OF THE UPPER LID.) A girl, aged 28, who 6 years previously fell on the back of her head, presented the symptoms of multiple sclerosis and nystagmus of both eyes with similar movements of the upper lids. The nystagmus of the upper lid was especially intense in looking upward, and ceased in looking downwards below the horizontal plane of fixation. It was very marked in looking horizontally to the side, and increased on convergence. The movements of the lids did not seem to be synchronous with the nystagmus of the globes.

Mechanical causes could be excluded. P. assumes a diffusion of the disturbance, active in nystagmus of the eyeballs, upon the nucleus of the levator, as it was increased in looking upwards, in convergence and exhaustion, and stopped in looking below the hori-

zontal plane when no tension of the levator comes into play and therefore none of the disturbances, otherwise encroaching upon it from the other nuclei of the ocular muscles with their effects. All these arguments move in the direction, that exhaustion is of marked importance. This is in concordance with the fact, mentioned in favor of the exhaustion theory of nystagmus in miners, that the upward fixation is most tiresome. C. Z.

CONTRIBUTIONS TO THE KNOWLEDGE OF NYSTAGMUS OF MINERS. OHM, JOHN, Bottrop (*von Graefe's Arch. f. Ophth.*, 91, p. 101), gives a very exhaustive description of the clinical aspect of miner's nystagmus. For ascertaining the course of the oscillations, their velocity, etc., O. developed a method of his own by which the oscillations are written in forms of curves on a kinematograph kymographion by levers attached to the upper lids. All attempts with which promises the best results were so far not successful.

The first characteristic quality of miner's nystagmus is the equal duration of both phases of the oscillations. Hence it may be called pendulum nystagmus.

The second important property is the mathematically exact succession of the oscillations, the curve showing regular undulations. By this it is distinguished from labyrinthine nystagmus and congenital nystagmus, of which three forms are observed: irregular, undular and jerky nystagmus. The duration of the oscillation varies. The lowest number in one minute was 150, the highest 425. The duration of the oscillation increases with the height of the person, the number of oscillations decreases with the height of the person. In the single case the duration of oscillation under equal conditions during an examination has a, mathematically exact, constant value. The binocular duration of oscillations is isochronous not only in equal but also different directions and amplitudes. The duration (number) of oscillations in the light is less (greater) than in the dark. The duration of oscillations (number) increases (decreases) in raising the eyes from downward position to the horizontal or above this. Micrometrical measurements of the curves showed that the oscillations of miner's nystagmus were small. 0.6 mm. was the highest value, most were smaller, waves of less than 0.1 mm. height are not well noticeable. The path of the oscillations was difficult to measure exactly.

The chief forms of nystagmus were vertical, horizontal, oblique, circular, and elliptic, and the most important and most frequent the turning like a wheel. In general the form of nystagmus is constant under equal external conditions. Occasionally, however,

a large number of different directions of the oscillations may be encountered in the same case.

Comparing the nystagmus of both eyes, the binocular curves showed the same form of oscillations. The duration of oscillation is equal, but the amplitude, if the direction is the same, differs in most cases. O. doubts the occurrence of monocular nystagmus. He considers the investigation of the duration of the oscillatory phases of both eyes, although very difficult, of great importance for an approach to the conception of the central localization of miner's nystagmus.

The examination with the binocular ophthalmoscope proved for binocular wheel nystagmus a complete harmony of innervation in the sense of a homonymous impulse. In two cases the vertical nystagmus was exactly homonymous in both eyes, while in another case it was heteronymous. In wheel nystagmus the low numbers of oscillations are more frequent, and the high numbers above 350 do not occur at all. In vertical nystagmus the very high numbers occur besides the low numbers and among them the highest ever observed, 426. The wheel nystagmus is more frequent in tall than in small persons.

Lid spasm was often observed with nystagmus, but it is not an essential part of it, as there are cases without it. Illumination, direction of fixation and tremor of other parts of the body have a certain influence upon it.

Miner's nystagmus is a proteus which frequently changes its form. Who wishes to avoid errors in estimating the ability for work of a person, affected with nystagmus, must consider all influences to which nystagmus is subject, viz., position of eyes, accommodation resp. convergence, illumination, central vision. Nystagmus is a disturbance of the central part of the field of fixation. It is worst mostly above the center, more rarely below, sometimes to the right, sometimes to the left. The extreme periphery of the field of fixation is totally, or almost, free from it. Darkness exerts a stimulating, light a quieting influence upon the nystagmus of miners. O.'s observations leave it doubtful whether high degrees of ametropia create a predisposition to nystagmus. It seems, however, advisable to correct errors of refraction in nystagmus.

C. Z.

NERVOUS SYSTEM

THE SIGNIFICANCE OF EYE SYMPTOMS IN DISEASES OF THE NERVOUS SYSTEM.—MARTIN, GEO. H., Pasadena, Calif. (*Jour. Ophthal. Otol. & Laryngol.*, June, 1916.) Outside of the local

diseased lid conditions which cause ptosis, a lesion of the third nerve is the most common cause.

Strabismus may be caused by lesions of any of the nerves supplying the external ocular muscles and the cause of these palsies is the important question to settle as well as the site of the nerve lesion.

Nystagmus is due to many causes such as weakness of the ocular muscles, astigmatism, foreign bodies in the eye and irritation of the middle ear. True nystagmus occurs frequently in multiple sclerosis and syringomyelia; also in cerebellar lesions. Nystagmus is undoubtedly due to a perverted state of the association centers and is produced by alternate discharges of motor energy from both sides of the brain.

Dilatation of the pupils may be due to irritation of the cervical sympathetic or to paralysis of the third nerve.

Contraction of the pupils, also, may be irritative, due to irritation of the third nerve or ciliary ganglion; or to paralysis of the cervical sympathetic ganglion or nerve. Unequal pupils occur in many conditions but are of no special diagnostic value. Pupillary reflexes are of the utmost importance. Their reaction to light is diminished or lost in lesions of the reflex arc, optic nerve, corpora quadrigemia, motor oculi nucleus, third nerve and ciliary ganglion. When the optic nerve or corpora are involved the consensual reflex is lost. The pupillary reaction to light is absent in blindness, deep sleep, narcosis, shock, coma, in epileptic, sometimes in hysterical attacks, in tabes and in many cases of paresis. Reaction to accommodation is absent in lesions of the third nerve, sometimes after diphtheria and sometimes in alcoholism. The reverse reaction to the Argyll-Robertson pupil, where the pupil responds to light but not to accommodation occurs sometimes in diphtheretic paralysis, syphilis, basal meningitis, tumors of the corpora and myelitis. Immobile pupil may occur in lesions of the optic nerve or tract, in the third nerve, or ciliary ganglion or nerve; it also occurs in tabes, epilepsy, in hysterics and in fainting.

Cerebral blindness is always a hemianopsia. When homonymous it indicates a lesion in the optic tract posterior to the chiasm, or the geniculate bodies, the ophthalmic thalamus, or near the contralateral calcarine fissure or the occipital lobe. When of slow onset and associated with choked disc a brain tumor is indicated. Bitemporal hemianopsia is usually due to a tumor compressing the central portion of the chiasm. A nasal hemianopsia may be due to a tumor compressing the outer part of the chiasm on the same side.

Yellow vision is common in jaundice.

Red vision is sometimes present in neurasthenia and hysteria, and green vision in diseases of the optic nerve and retina.

Muscae volitantes occur in neurasthenia, circulatory disturbances of the brain and in digestive disturbances.

Flashes of light may precede a severe headache, or an attack or epilepsy.

Achromatopsia may be congenital, it may be complete or partial, and it may be the early stage of a gradually developing blindness or amblyopia.

Choked disc, optic neuritis and optic neuritis are described as symptomatic of their appropriate brain and physical conditions.

M. B.

CONTRIBUTIONS TO THE NEUROLOGY OF THE EYE. I. TO THE PATHOLOGY AND LOCALIZATION OF THE OPTICAL FIXATION REFLEX. PICK, A., Prag., (*Archiv. f. Aug.*, 80, p. 31), described in former publications, (*Deutsche Med. Woch.*, 1905, No. 39, and 1907, No. 1), a method of examination of the visual field in somnolent conditions. It was based on his observations that in conditions of severe stupor from cerebral pressure the patient reacts with the fixation reflex of the eyes upon a shining object, suddenly brought into his visual field. This may be thus explained: Normally the impulses for fixation elicited from peripheral places of the retina are so weak that the voluntary fixation by the fovea is not influenced by them. If consciousness is diminished, this fixation is materially weaker and consequently the normal behavior turns into the opposite; the fixation of the patient is detracted by any, more lively, stimulus coming into his visual field from outside and the fixation reflex necessarily occurs.

The following case is reported: A man, aged 62, was drowsy, had convulsions, right hemiplegia, amnesic aphasia, apraxia, and choked discs. The fixation reflex to a shining object from the left occurred promptly, but not at all when the object was approached from the right side. The voluntary ocular movements to the right were not as prompt as those to the left. There was no right-sided hemianopia, as at first supposed. The diagnosis was: tumor of the left hemisphere, subcortical, at the region of the anterior central gyrus, directly involving the posterior central circumvolution.

The autopsy revealed a tumor 3:2½ at the posterior portion of the frontal lobe and the anterior central gyrus. The left lateral and 3rd ventricles were displaced to the right and collapsed. It was a metastasis from a carcinoma of the lungs.

The case presented a clinically not yet observed form of dissociation between voluntary and involuntary fixation movements and confirms one of the theoretical postulates of such dissociations. The fixation reflex was lacking (the visual function of the corresponding half of the retina being preserved), with preserved, although retarded, voluntary fixation movements of the eyes to the same side. It thus was the opposite of the so far known dissociation between fixation reflex and voluntary fixation, as Wernike described the lacking voluntary ocular movements with preservation of the corresponding fixation reflex in consequence of lesion of the parietal lobe.

P. urges to examine future cases with regard to this phenomenon for elucidation of the question of localization, which here could not be solved.

NOSE AND EYE

OCULAR TUBERCULOSIS OF NASAL ORIGIN.—LUEDDE, W. H., St. Louis. (*Annals of Ophth.*, Jan. 1916, p. 69.) We have noticed for years the frequency with which tuberculosis follows so-called "colds." Anatomically the direct conveyance of the infection to the eye from a tubercular process within the chest is very unlikely. Ocular tubercles are likely to be present in connection with general miliary or meningeal tuberculosis. Some cases reported pertaining to the relation of ocular tuberculosis to the nose and throat (*Am. Jour. Ophth.*, Oct. 1914) gave the usual history of a cold preceding the onset of the ocular inflammation. None of them showed any constitutional evidences of the disease. Only the nose and eye showed a positive reaction to tuberculin. We have found this nasal reaction frequently in connection with ocular tuberculosis. Chronic inflammation of the upper air passages is caused by the tubercle bacilli which are deposited there from the outside during respiration, or from an active pulmonary process by expectoration. These tubercular inflammations in the upper air passages give a positive reaction to subcutaneous tuberculin injections and should be sought out carefully. The nasal reaction may be merely an increased localized hyperemia. Positive reactions in the sphenoidal and postethmoidal sinuses on the same side as the affected eye are most valuable reactions. The orbit has lymph spaces which are not always separate and distinct from the submucosa of the nasalsinuses. Clinically the usual location of the tubercular inflammation in the ocular tissues is in close relation to the lymph spaces. Usually the attack is limited to either the anterior or posterior segment of the globe.

The scleral openings for the emissary vessels of these intraocular lymph spaces are the points of least resistance. They exist at the posterior pole of the eye, near the equator, and farther forward. Tubercular inflammations are usually found at these points. The decreased intraocular tension in these cases leads to the suggestion that there may be free lymph communication extra- and intra-ocularly through open emissaria. The optic nerve lymph spaces are in relation to the sphenoidal and postethmoidal sinuses in the canalus opticus, and tubercular lesions are found in this location. Perhaps the strongest evidence that tubercular inflammations of the eye are closely dependent on nasal infections is the curative effect in the eye following nasal treatment, both medical and surgical. For the first day or two after opening the sphenoidal and postethmoidal cells the ocular symptoms are usually aggravated. In four or five days the ocular disease is arrested, accompanied by improvement in vision. Usually the operation on a given side of the nose affects only the ocular condition on the same side, though the opposite eye may be improved.

J. M. W.

OPERATIONS

CYCLO-DIALYSIS.—DENMAN, IRA O., Toledo. (*Jour. Ophthalm. Otol. and Laryngol.*, May, 1916.) Cyclo-dialysis was introduced by Heine of Breslau in 1905. The conjunctiva is incised and raised as for a tenotomy, and then, with the side of the point of a keratome, a careful dissection through the sclera is made at a point about 5 mm. from the limbus at the outer and lower angle, about midway between the insertions of the external and inferior recti muscles. The incision parallels the limbus and is less than 2 mm. in length, being only large enough to admit of an ordinary iris spatula. The dissection must be stopped as soon as the black color of the pigment epithelium of the uvea appears. The spatula should be repeatedly tried and as soon as it will enter the incision is complete. The spatula is bent at an angle of 45 degrees and passed into the incision and slid along between the sclera and uveal tract until it appears in the anterior chamber. The handle is now moved causing the blade to pass both ways and thus destroy the pectinate ligament for a distance of a quarter of its circumference. The incision is closed by a conjunctival stitch. Considerable care must be exercised to pass the instrument into the anterior chamber through the supra-choroidal space. If the spatula is passed too far forward it will separate Descemet's membrane from the cornea and not enter the anterior chamber at all and yet it will have the

appearance of having done so. If pressed too far back the root of the iris is penetrated. Either of these mishaps will defeat the purposes of the operation and result in failure. The failures reported and the criticisms of the operation in the author's opinion are largely the results of faulty technic. M. B.

A SUTURELESS FLAP FOR TREPHINING OR CYCLO-DIALYSIS.—MYERS, DEAN W., Ann Arbor, Mich. (*Journ. Ophthalm., Otol and Laryngol.*, May, 1916.) The incision is slightly curved, begins over the attachment of the external rectus and ends midway between the attachment of the superior rectus and the inner canthus. It should be about 10 mm. from the corneal margin. The flap is seized at about its center and drawn downwards as it is loosened from the sclera with sharp pointed scissors. This is practically the same flap as advocated by Elliot except that it is placed a little more to the temporal side. Elliot does not use sutures. M. B.

OPTIC NERVE

HOLE IN THE DISC.—CLAIBORNE, J. HERBERT, New York City. (*Anals of Ophth.*, April, 1916, p. 299.) The author gives a brief description of a case which he diagnosed as "Hole in the Disc." In the right optic nerve head on the temporal side there was a hole which looked as if it had been punched out, but on measuring it was found that the bottom slightly shelved toward the temple. There was a blood vessel which crossed the bottom from above and some smaller ones which plunged sharply into it on the temporal side, after the manner of blood vessels in glaucomatous excavations. The hole was oblong in character and the bottom was slightly mottled. The depth on an average was 3 D. The author presents an illustration of the condition, and expresses the opinion that it is a partial coloboma of the optic disc. J. M. W.

ON CHANGES OF THE OPTIC NERVE IN INTRAOCULAR INFLAMMATION.—FUCHS, E. WEIN. (*Von Graefe's Archiv. f. Ophth.*, 91, p. 1.) Changes of the optic nerve in severe and light cases of ectogenous inflammation are not mentioned in the treatises on pathological anatomy of the eye, but have been the subject of special clinical and anatomical investigations. F. reports in this elaborate paper his anatomical examinations of 42 cases of ectogenous intraocular inflammation after perforating injuries. Two indications gave the reason for enucleation: Signs of incipient

panophthalmitis, and in cases of more insidious inflammation the danger of sympathetic ophthalmia. In the latter case enucleation was only performed if there was no prospect of useful vision. Therefore it was only proposed to the patient when perception and projection commenced to fail.

The cases are arranged in three groups: I. 27 cases of endophthalmitis, i. e., purulent inflammation of the vitreous space. II. 3 cases of chronic traumatic infiltrating iritis. III. 12 cases of common traumatic iritis in which the inflammation was essentially confined to the anterior chamber. The changes of the optic disc consisted in swelling, infiltration with lymphocytes and exudation at its surface.

In the first group, in endophthalmitis, the optic disc always participates very much in this inflammation, and the stem of the optic nerve is more or less degenerated. Its later atrophy therefore is not a consequence of the atrophy of the globe with which the endophthalmitis ends, but originates in the first few days of the intraocular inflammation.

The intense affection of the optic nerve in the second group, the cases of chronic infiltrating traumatic iritis, is readily conceivable, as there the toxins act upon the disc longer, although less intensely. It is surprising to find the optic nerve often and sometimes greatly involved in the third group, of simple traumatic iritis, because otherwise the changes of the posterior ocular segment are slight. It must be ascribed to the fact that toxins are conveyed backwards from the anterior chamber through the pupil. The ciliary body shows no inflammation of any amount, the retina at the most periphlebitis, but inflammation of the disc and degeneration of the optic nerve are found. The degeneration is due to the lesion of the nerve fibres and ganglion cells of the retina. F. assumes, that these structures are altered by toxins which are too weak for creating inflammation of any degree to speak of. Only the disc usually presents inflammatory changes, perhaps because the toxins act upon it especially intensely in consequence of the direct convection of pus through the hyaloid canal.

F. derived from the facts found the following practical conclusions: The behavior of the optic nerve in endophthalmitis has no practical significance, since these eyes are lost anyway. In traumatic iritis the optic nerve may be affected. This may be inferred from the ophthalmoscopic examination and testing the perception of light. In most cases the ophthalmoscopic examination is not possible, but also the behavior of the perception of the light is not

reliable, as it may depend merely upon functional disturbances of the nerve fibres, aside of the anatomical changes. This can only be decided after longer observation. The abolition of the preception of red, however, proves a permanent destruction of the optic fibres.

Another important point for practice is that the behavior of the perception of light is considered decisive for the question of enucleation, assuming that it is a gauge for the degree of inflammation in the posterior ocular segment. Decrease and disappearance of perception of light is supposed to be a sign of endophthalmitis. F. says that this must be acknowledged as error; even complete loss of perception of light may co-exist with almost unaltered posterior ocular segment. Therefore it must be conceded that at present we are not able in a recent case of ectogenous inflammation with more intense iritis to diagnose whether endophthalmitis is present or not. Only the further course of the case may clear this. Thus sometimes an eye may be enucleated, that might have been preserved or might have gained a moderate amount of vision. F., however, does not infer from this in future not to utilize the condition of the perception of light as indication for enucleation. In the large majority of cases the abolition of perception of light is due to endophthalmitis. We thus might preserve a few eyes which would not need to be removed at the expense of a great increase of sympathetic ophthalmia.

C. Z.

HEREDITARY OPTIC ATROPHY (LEBER'S DISEASE).—FISHER, J. HERBERT, London. (*Report of 1916 Congress, Ophth. Soc. United Kingdom, Brit. Med. Journ.*, May 13, 1916.) The writer brought forward evidence that it was dependent upon changes in the pituitary body. Having referred at length to the literature, he pointed out that in some cases the defects in the visual fields were remarkably symmetrical. He believed that this could not be explained as due to atrophy following the transient papilloedema which had been described in Leber's disease, and argued that the symmetry of the defects pointed strongly to direct implication of the visual pathways by a single lesion. He suggested that temporary disturbance of moderate degree of the pituitary body might be adequate to explain the phenomena of this disease. He drew a parallel between the signs and symptoms of Leber's disease and disease of the pituitary. Frontal headaches, vertigo, epileptiform attacks, and subjective visual phenomena were seen in both, as also a somewhat characteristically mild degree of papilloedema. The relation of the pituitary gland to the sexual organs was very close, as was

seen in precocious or arrested development of these organs and impotence in pituitary disease, and the enlargement of the gland which occurred during pregnancy. So in Leber's disease there were two periods of onset—one at about the age of puberty, and a second period in women at the time of the menopause. The very close anatomical relation of the chiasma to the pituitary was insisted upon. Two children, the subjects of Leber's disease, were examined as to the existence of any abnormality in the sella turcica by means of x-rays; in one no abnormality was found, but in the other unusual conditions were certainly present. This positive fact, taken with the considerations set out in the paper, led him to suspect that when an opportunity offered to some observer, it would be found that Leber's hereditary optic atrophy was primarily due to an inherited temporary disorder of the pituitary body.

C. H. M.

OPTIC ATROPHY—OBSERVATIONS ON A SERIES OF CASES OF UNUSUAL INTEREST.—KRAUSS, F., AND BROWN, S. H., Philadelphia. (*Ann. Ophthalm.*, April, 1916.) The case of a 13-year-old girl is reported. Syphilitic, either hereditary or congenital. Preceding her first symptoms of eye trouble she had some kind of an illness in which she suffered from "nervousness," vertigo, and pains in head. When she returned to school she became aware of increasing failure of vision of left eye which rapidly became blind, and of some failure of vision of right eye. The left ear was discharging and there were nasal symptoms of thmoidal or frontal sinus disturbance. The left optic nerve was atrophic and the right one was apparently in an early stage of atrophy with vision of 5/6. It was finally decided that the ear and nose were not responsible and sole dependence was placed in antisyphilitic treatment (mercury and neosalvarsan), which resulted in checking the atrophy with resulting vision of 5/5 in the right eye.

Case 2. Male, age 34. Failing vision for two years. Pupils widely dilated and reacting slightly to light. Slight ptosis of right upper lid. Vision of right eye consisted of hand movements and left of faint light perception. Optic nerves in state of advanced atrophy. Wasserman's test +2, but the spinal was doubtful. Treatment by mercurial inunctions and neosalvarsan and later by potassium iodid resulted in a negative Wasserman in three months with vision sufficient for him to find his way about the hospital.

The third case was one of optic atrophy coming suddenly without immediate obvious cause in a man of 50. He complained of rapid loss of sight, no pain. When first seen he was absolutely blind with

white atrophic nerves and moderate contraction of retinal vessels. No cause was ever found and all treatment proved of no value.

The fourth case was one of optic atrophy with (left) homonymous hemianopsia in a man of 50 who gave a history of having a dizzy spell with pain in head seven months previously. Subsequently he grew weak and in a week had to stop work. Palsy of one arm shortly supervened and symptoms of hemianopic vision. He now attempted to commit suicide by cutting his throat. It was while convalescing from this injury that they had an opportunity to study his ocular condition. The right fundus showed but little pathologically. The left disc was very gray with well marked excavation, with an opaque retinal area down and out from the disc.

The visual fields for white showed entire absence of any field to the left of fixation. The case passed out of observation before further study could be made of it. It was assumed that there was a hemorrhage into the occipital lobe in the calcarine fissure to one side of the optic center.

The fifth case was that of a man aged 43 with optic atrophy incidental to intraorbital or intracranial benign neoplasm. The case was under observation 16 months. No definite cause could be assigned so that empirically iodid of potassium was administered with final resolution of the symptoms which were confined largely to the left eye.

His sixth case was in a man of 26 who was typical of the *typus feminis* as seen in pituitary deficiency. The principal things noted in the ophthalmoscopic examination were, that the power of convergence was absent, the alteration in the visual fields, the left eye was reduced in vision to 1/60 and the atrophic changes in the nerve of left eye.

The patient was operated upon by Dr. Frazier via the trans-sphenoidal route for a pituitary tumor with slight improvement resulting.

M. B.

PHYSIOLOGY

EXPERIMENTS FOR THE PROOF OF ANTAGONISM OF SENSATIONS OF THE RETINA. STROHAL, R., (From the psychological institute of Prof. G. E. Miller in the University of Goettingen (*Veitsch. f. Sinnesphysiologie*, 49, p. 1), reports his experiments for investigating whether the consequence of Hering's theory in the following example can be experimentally proven: If a red and a blue surface are thus prepared that for both the same addition of white is just noticeable, and if to the red and to the blue the same

quantity of a certain yellow is admixed and if for the red + yellow surface and for the blue + yellow surface the just noticeable addition of white is found, this will be smaller in the case of blue + yellow than in the case of red + yellow, if really, as Hering's theory says, in the mixture of blue and yellow in consequence of the antagonism of the chromatic sensations a mutual checking of these sensations takes place.

The results were: If 2 colors are so determined that an addition F for both colors at the same intensity is just noticeable and if to each of both colors the contrast color of one of them is added, the addition F in the mixture of the contrast color is earlier just noticeable than in the mixture of the colors which are not contrast colors. Thus there is all reason for asserting that actually at the mixture of the contrast color in consequence of the antagonism of the chromatic sensations a mutual checking of these sensations occurs, and that the resulting grey is a phenomenon of remainder.

C. Z.

MEASURING EXPERIMENTS ON THE DISTRIBUTION OF FUNCTION IN THE VISUAL ORGAN.—VON KRIES, J. (From the physiological institute in the University of Freiburg. *Zeitsch. f. Sinnesphysiologie*, 49, p. 297), sets forth that, aside of extreme cases, we are informed qualitatively on the kind of division of function of cones and rods: with increasing illumination the cones more and more come to the foreground, the rods to the background. Quantitatively, however, so far nothing definite can be stated. As soon as colored qualities occur in the function of cones their function becomes incomparable with that of the rods. But suitable foundation for such investigations is given when also the cones furnish only a colorless sensation of illumination, especially in seeing with very eccentric parts of the retina. For these the relation of light and dark of two different lights wavers, e. g. of a long-waved and a short-waved, or of a colored and mixed white lights according to adaptation and absolute illumination between two extreme values, the one of which we may assume corresponds to the exclusive function of the rods, the other to a mere activity of the cones. If under variable conditions an adjustment of this relation to values fluctuating between those extremes is found, this will be apt to present a picture of the collaboration of both organs. By this a possibility is given of exactly measuring that dependence, qualitatively known to us in this sense.

The principle of the plan of experimentation was to test the fashion of function of the eye with a number of suitable intensities

of lights after sufficient exposure to each of these lights for attaining a certain degree of adaptation, corresponding to this intensity of illumination, and to ascertain under this intensity of illumination the relation of light and dark of two lights, under which they seen eccentrically and consequently colorless, appear equal. VeVry saturated red and grey papers were used, equal to the red under very much diminished illumination and good dark adaptation. At intense illumination and maximal light adaptation the red had a peripheral value. C. Z.

FURTHER INVESTIGATIONS ON THE LIGHT SENSE OF LARVAE OF MUSCADE.—WEVE, H., Rotterdam (From the eye clinic of Prof. V. von Hess in the University of München. *Zeitsch. f. Sinnesphysiologie*, 49, p. 316), proved by experimental and anatomical investigations on the light sense of larvae of calliphora erythrocephala, the most common meat fly in Western Europe, that these larvae show such a behavior toward colored light, that they must lack any color-sense, because their motions of flight in the spectrum suggest a distribution of perception in strikingly accurate concordance with the distribution of lightness in the spectrum, found by E. Hering for the totally color-blind man. They thus behave exactly as C. von Hess ascertained in all invertebrates examined by him. W.'s spectral method was based on the peculiarity of the larvae to flee from any light, almost in the direction of the rays of light. As it required a complicated apparatus and much time, W. repeated his experiments with the simpler measuring method, devised by C. von Hess (*Zeitsch. f. Biologie* 63, p. 254 and *Archiv. f. vergleichende Ophthalmologie* 4, 1). These are reported in detail and drastically corroborate his former observations, that the larvae of calliphora erythrocephala behave with regard to their light-sense as the totally color-blind man. C. Z.

RETINA

CURES FOLLOWING DETACHMENT OF THE RETINA.—PATON, LESLIE, London (*Report of 1916 Congress, Ophth. Soc. United Kingdom, Brit. Med. Journ.*, May 20, 1916). This was the report of the committee appointed by the society to investigate the cases of cure of retinal detachments, composed of Messrs. Treacher Collins, Greeves, Mayou, Paton, Maitland Ramsay, and Storey. The committee had found it necessary to discard many cases on account of the incompleteness of the records, and no case was considered cured unless the retina was known to have remained reattached for at

least six months. The 85 cases investigated were distributed amongst the literature as follows: 45 English, 26 German, 10 French, 4 American. In 44 cases the cure followed some operative procedure, and some other line of treatment in 41 cases. The etiological factor in the cases was in 50 myopia, in 11 traumatism, in 6 albuminuria, in 4 albuminuria of pregnancy, and one pregnancy without albuminuria; 13 cases were "idiopathic." C. H. M.

TUMORS

REPORT OF A CASE OF EPITHELIOMA OF THE LOWER EYELID.—MOON, S. B., Pittsburgh (*Jour. Ophthal., Otol. and Laryngol.*, March, 1916). A man, aged 57, was operated upon for an extensive epithelioma involving the upper and lower lids and external canthus and extending downward on cheek for four centimeters. This area was surrounded by a hyperemia and hypertrophy of 3 or 4 cm. more. A Dieffenbach's operation was done. The flap shrunk in the healing and the lines of incision began to break down, the epitheliomatous process progressing rapidly. Radium treatments were carried on by Dr. Frederick Proescher, and continued at intervals of a few days for about a month, in all ten applications were made, each lasting five hours, and the quantity used was fifteen milligrams in the form of a flat varnished applicator one square inch in size without a screen. The part healed without there being any evidence of the growth. M. B.

VISION AND COLOR VISION.

THE VISUAL STANDARDS USED IN THE MEDICAL EXAMINATION OF RECRUITS IN THE BRITISH ARMY AND CONTINENTAL ARMIES.—PATERSON, J. V., TRAQUAIR, H. M., Edinburgh (*The Lancet*, May 6, 1916). The authors submit a table showing the visual standard for recruits in the chief European armies. In France, Germany, Austria and Italy, the vision with glasses determines the acceptance or rejection of a recruit; whereas in Great Britain, it is the vision without glasses which counts. This difference is due to the fact that up to the commencement of the present war, the British army was organized largely for foreign service at a great distance from its base, where there might be difficulty in providing proper fitting glasses. In the British army the standard for general service requires *without correction* vision of 6/24 in the better eye and 6/60 in the worse eye, which must be the left. In Germany combatants are required to have corrected vision of at least 6/12 in one eye,

while in the other eye, the corrected vision may be minimal, and in the Landstrum the second eye may even be blind. In the armies of Germany, Austria, France and Italy, more than six dioptries of myopia are allowed. As far as shooting is concerned, it is generally agreed that vision of 6/12 at least is necessary, and on the continent it is believed that a soldier with 6/12 vision wearing glasses is more efficient as a combatant than another with 6/24 vision without glasses. Continental authorities have found that on an average soldiers who see best shoot best, and that those who wear correcting spectacles shoot better than those who do not.

The authors conclude with the following summary:

1. The present sight test for general service for recruits for the British is by far the highest in Europe, and excludes from the fighting line large numbers of men who are freely used as combatants in the armies of the chief continental powers.

2. This is due to the fact that in the British sight test the vision without glasses (uncorrected vision) is what counts, whereas in the chief continental armies it is the vision with glasses (corrected vision) which counts.

3. In view of the present want of men there is urgent need for the immediate adoption of a remodelled sight test based on corrected vision, on the lines of the military visual standards in use on the continent of Europe.

J. M. W.

THE CLASSIFICATION OF THE COLOR-BLIND.—EDRIDGE-GREEN, F. W., London (*The Ophth. Review*, Jan., 1916). This classification is based upon the facts of color-blindness discovered by the writer, which he considers now thoroughly established and in many cases re-discovered by others. Since these facts were discovered entirely through the theory of color vision which he adopted, the writer begins his article with a summary of this theory to show how it explains the facts as far as the color-blind are concerned:

“A ray of light impinging on the retina liberates the visual purple from the rods and a photograph is formed. The rods are concerned only with the formation and distribution of the visual purple, not with the conveyance of light impulses to the brain. The ends of the cones are stimulated through the photo-chemical decomposition of the visual purple by light, and a visual impulse is set up which is conveyed through the optic nerve fibres to the brain. The character of the stimulus and impulse differs according to the wave-length of the light causing it. In the impulse itself we have the physiological basis of the sensation of light, and in the quality of the impulse the physiological basis of the sensation of color. The

impulse being conveyed along the optic nerve to the brain stimulates the visual center, causing a sensation of light, and then passing on to the color perceiving center causes a sensation of color. But, though the impulses vary in character according to the wavelength of the light causing them, the retino-cerebral apparatus is not able to distinguish between the character of adjacent stimuli not being sufficiently developed for the purpose. At most seven distinct colors are seen in the spectrum, whilst others see in proportion to the development of their color-perceiving centers only, six, five, four, three, two, or none. This causes color-blindness, the person seeing only two or three colors instead of the normal six, putting colors together as alike which are seen by the normal-sighted to be different. In the degree of color-blindness, just preceding total, only the colors at the extremes of the spectrum are recognized as different, the remainder of the spectrum appearing grey."

The writer contends that this theory could not be true if the facts of color-vision were as stated in the books of twenty-five years ago. He gives a great many predictions which, having been fulfilled, exist as facts, to prove that color-vision is a secondarily developed power of discrimination and believes that these present difficulties to be solved by any other theory. Color-blindness is only an example of defective development; the sense of sight is developed first and then the sense of color. "First, there was a colorless spectrum, then a spectrum with a tinge of red at one end and a tinge of violet at the other; then the red and violet encroached on the white region until they met in the center, and a fresh color, green, was developed. In further development the red-green region was replaced by yellow, then blue replaced the violet-green region, then orange became distinguishable, and finally indigo. Every fact points to this being how the evolution of the color sense has taken place, and there are various degrees of color perception corresponding to every stage in the process."

"Cases of color-blindness may be divided into two classes, which are quite separate and distinct from each other, though both may be present in the same person. In the first class there is light as well as color loss. In the second class the perception of light is the same as the normal-sighted, but there is a defect in the perception of color. In the first class certain rays are either not perceived at all or very imperfectly. Color-blinded individuals belonging to the second class can be arranged in a series. At one end of the series are the normal-sighted and at the other the totally color-blind. I have classified the color-blind in accordance with the

number of primary colors which they see in the spectrum. If the normal-sighted be designated hexachromic those who see five colors may be called pentachromic, those who see four tetrachromic, those who see three trichromic, those who see two dichromic, and the totally color-blind. There are many degrees included in the dichromic class. The neutral region varies in size, being widest in those cases approaching most nearly to total color-blindness.

The fact of this graduation of color perception has now been definitely recognized. Shortening of the red end or violet end of the spectrum is a distinct defect from defective color discrimination. A normal-sighted person when examined with my spectrometer with a bright spectrum marks out about eighteen monochromatic divisions, those with defective color discrimination mark out a fewer number in proportion to their defect. The dichromic see two colors in the spectrum, red and violet, with a neutral division of varying size between the two colors. The trichromic see three colors in the bright spectrum, red, green and violet. The orange and yellow regions are seen as red-green, and the blue region as green-violet. Here we have persons who have three color sensations who are to a certain extent color-blind. A trichromic in conditions of difficulty becomes dichromic. As the colors are farther apart in the color-blind simultaneous contrast is increased.

He calls attention to the fact that many who are partially color-blind will make matches similar to normal at one luminosity and that a man will pass the Holmgren test with ease and yet confuse the green and red lights with his lantern. He regards the old classification of red-blindness, green-blindness, etc., as absolutely meaningless, and asserts that of the many thousands examined by him he has not found one who would come under this classification; even with the main varieties experts of exceptional ability may diagnose them differently. In the classification given by the writer the name indicates the characteristic which applies to every member of the class; for instance, every dichromic has only two color sensations, and when examined with a bright spectrum says that he sees only two colors and a neutral region. Shortening of one or other end of the spectrum, alterations in the luminosity curve or size of the neutral region whilst producing different varieties, do not affect the fundamental distinctions on which the classification is made. Since the classification is based only on fact it does not commit anyone with regard to theory. C. H. M.

DYSMETROPSIA.—WILSON, S. A. KINNEAR, London (*Report of 1916 Congress, Ophth. Soc. United Kingdom, Med. Press, May 17,*

1916). The cases of this peculiar condition (a defect in the capacity to appreciate the size and distance of objects) were divided by the writer into (a) those in which the lesion was presumably peripheral, (b) those in which it was probably central, (c) psychical cases. In a case of the latter the young woman, who was the subject of hysteria, always saw the right half of objects much larger than the left; and if two shillings were placed side by side, she considered that the one on the right-hand side was a half-crown. In a case of occipitoparietal tumor, the objects seemed so near that they appeared to be practically touching the observer's face. Wilson considered that in judging of distances and sizes of objects we learn more from the retina than from so-called kinæsthetic impressions.

C. H. M.

CONGENITAL MONOCULAR DISTURBANCES OF THE COLOR SENSE.—HEGNER, C. A. (From the eye clinic of Prof. W. Stock in the University of Jena. *Zeitsch. f. Sinnesphysiologie*, 49, p. 18), found in the left eye of a student, who had normal vision with -2.50 , on the anomaloscope an equation typical of an extreme protanomalous. When asked to look at this equation with the right eye it was at once rejected and only the normal equation was accepted. Tests with Nagel's and Stilling's plates had similar results, showing that the left eye was distinctly red anomalous. A red light of small intensity, flashed for a moment, was at once recognized by the right eye, not by the left eye, which saw it only after prolonging the time of exposure. Looking at a red placate from a longer distance the red appeared to the right eye much lighter than to the left. This was most striking when looking at the violet hues of the evening sky. As there were no ophthalmoscopic changes of the retina and optic nerve, a congenital disturbance had to be assumed.

The anamnesis rendered it likely that the present difference of the functions of both eyes was not the original condition. Two and a half years ago the patient experienced difficulties also in his right eye in recognizing finer distinctions of colors in his microscopical work, so that his instructor had asked him whether he was color blind. Hence it may be not unlikely that formerly the color sense of the right eye was also deficient or that an equal weakness for colors existed in both eyes, which by constant practice has subsided in the right eye, exclusively used in microscopy.

Experience shows that as a rule persons with defective color sense retain this unchanged during their whole lives. The present case, however, justifies the assumption that just as the light perceiving

elements of the retina may under favorable conditions be improved in function, as systematic exercises in congenital amblyopia show, this may also be the case with the color preceiving elements. Hence the patient was told to use from now on only his left eye for his microscopical observations.

For gaining an idea as to the frequency of such monocular disturbances, H. tested the color sense of 50 male patients of different ages, mostly students. Ten, i. e. 20%, showed a marked disturbance of color sense. Of these 6% were distinct dichromates, 4% extreme anomalous, 10% had slight but distinctly noticeable disturbances, 2, i. e. 4%, of the 50 had a decided difference of the color sense of both eyes, and are described in detail.

With regard to the practical question whether such a person with monocular deficiency of color sense is unfit for railway or naval service, H. concludes from his examination of the above described cases that in binocular vision the color sense of the normal eye is determining and that thus such a patient has no less certainty with regard to colors than a normal person. Consequently an individual, affected with monocular color weakness, but normal vision, may satisfy all requirements of recognizing colors as well as a normal person.

C. Z.

VISUAL FIELD

PERIMETRIC STUDIES OF THE NORMAL AND PATHOLOGIC BLIND SPOT OF MARIOTTE.—PETER, LUTHER C., Philadelphia (*Ann. Ophthalm.*, April, 1916). In the study of the blind spot, most accurate results are obtained at a close range, especially in the study of colors. At a 16.5 cm. radius, little variation is noted and errors are more quickly corrected. General deductions which may be made from the studies of Mariotte's blind spot are: First, the average normal blind spot is $7^{\circ} 40'$ long by $5^{\circ} 28'$ wide, and is situated $15^{\circ} 49'$ from the fixation center, the upper edge extending about 2° above the horizontal meridian; second, physiologic and anatomic variations noted are (a) the vertical diameter may show shortening, and (b) the blind spot may be at a greater distance than $15^{\circ} 49'$ from the macula; third, the pathologic blind spot first shows a zone of qualitative color loss, second a relative enlargement—i. e., for colors—and finally an absolute enlargement.

Some of the conditions in which the blind spot may become enlarged are: The congenital are coloboma of optic nerve and opaque nerve fibers. In the latter the enlargement is relative for colors and more frequently shows only a qualitative color loss. In low

grades of myopia the distance of the blind spot from the fixation center is increased. In high myopia the blind spot is much enlarged. Enlargement of the blind spot is probably of more value as a diagnostic symptom in accessory sinus disease than in any other condition in which it occurs. This has not been appreciated by men who have tried to chart it by use of an arc perimeter. It should be done with the campimeter which has a flat field. It is not always enlarged in all forms and stages of sinus disease. It is least frequently observed in frontal sinusitis and most frequently in diseases of the sphenoid and posterior ethmoid. Where the optic nerve passes through the bony foramen the outer covering of the nerve is continuous with the periosteum of the bone. Even a simple congestion of these sinuses may give rise to pressure on the nerve without extensive bone involvement. The anterior ethmoid and antrum must be profoundly affected before the orbital cavity becomes invaded. Acute inflammations of the sphenoid and posterior ethmoid are apt to produce optic nerve symptoms quite early with enlargement of the blind spot. This symptom, however, is of the most value in chronic forms of sinus disease. A central scotoma may or may not accompany the enlarged blind spot. Enlargement of the blind spot is present in fairly early stages of chronic interstitial nephritis, long before the typical albuminuric retinitis manifests itself. The same condition, in lesser degree, obtains in high blood pressure of chronic diabetes.

Probably all forms of optic neuritis are accompanied by enlargements of the blind spot. Like the central scotoma, enlargements of the blind spot are of more diagnostic value in forms of true retrobulbar neuritis without observable ophthalmoscopic signs. The early change is a qualitative color loss followed by a relative loss for one or more colors, and finally an enlargement for white. Enlargements of the blind spot are noted in choroidal and retinal disease limited to those tunics of the eye.

In disease of pure nerve elements, the blind area enlarges progressively for form to blue, then red, and finally green. When the choroidal involvement predominates, blue may suffer more.

In commotio retinae irregular enlargements of the blind spot occur in accordance with the extent of damage done to the choroid adjacent to the nerve entrance.

M. B.

VISUAL FIELDS IN GLAUCOMA.—BISSELL, ELMER J., Rochester (*Jour. Ophthalm., Otol. and Laryngol.*, May, 1916). Visual field tests rank high as aids to early diagnosis, and if skilfully made and recorded they usually become the best guides as to the progress

of the disease. The instruments required are, a good perimeter, a stereoscope and a Bjerrum screen or some form of campimeter. The perimeter is best adapted for taking the form and color fields, except when they are contracted to within 10° of the fixation point. If the patient has binocular vision a stereoscope and *Haitz cards* are particularly adapted for measuring very contracted fields. The author has a card which is about three inches longer than the *Haitz* and is marked in 3 mm. squares. For this card it is desirable to have a stereoscope with about +4 combined with a 9° prism in revolving cell before each eye. The Bjerrum screen is the best instrument for measuring the blind spot and all scotomata between 5° and 25° of the fixation point. One of the great difficulties in all visual field testing is for the patient to maintain central fixation. To aid in this fixation the author has had made a two point alignment instrument. With it a high degree of accuracy is possible and with less ocular fatigue. Bjerrum says that a normal blind spot excludes glaucoma, to which the author largely agrees. In glaucoma, early stages, the blind spot may be normal with a 10 mm., but considerably enlarged with a 3 mm. test object. Small paracentral scotoma may be discovered near the blind spot and often merging into it. As the disease progresses the blind spot enlarges for even a 5 or $7\frac{1}{2}$ mm. test object, and a sector-like defect may appear in the temporal field. Enlargement of the blind spot occurs in nasal sinus disease and the author thinks this may argue in favor of a causal relationship.

M. B.

PERIPHERAL RING SCOTOMAS.—ZADE, M., Heidelberg (From a field hospital on the Western front, *von Graefe's Arch. f. Ophth.*, 91, p. 159), observed a peripheral ring scotoma in a soldier, who for months had served a cannon for defense against aircraft and complained of glaring and headache. At this instance Z. examined a large number of officers and soldiers, who as aviators, observers of aircraft, or occupied in serving cannons and machine guns directed against aeroplanes, had to expose their eyes to glaring light. A large percentage out of ten attendants of a machine gun and five out of nine aviator officers had ring scotomas. The peripheral ring scotoma was a scotoma for white and lay from 35° to 50° from the point of fixation. It had the shape of a ring, sometimes incomplete, sometimes of a temporal crescent. The zone of the ring-shaped defect was only one or a few angle degrees wide, and only the center of the ring zone was an absolute scotoma. Subjective symptoms of glaring were lacking, except in two hysterical patients. Vision and ophthalmoscopic condition were normal. The

scotomas had existed for at least two months and may be supposed to persist as long as the damaging causes continue.

The so far observed ring scotomas are according to Birch-Hirschfeld of two kinds: The ring scotomas from glaring by sun light, short circuit and uviol lamps and the physiological scotoma. Both lie from about 20° to 40° from the point of fixation. The ring scotomas found by Z. form a group for themselves. Analogously to the beginning of retinitis pigmentosa in a peripheral ring zone, Z. thinks that the diffuse glaring of the retina will first affect the same peripheral ring zone, being physiologically weaker.

After this observation protectors of yellowish green glass were at once introduced.

C. Z.

Book Reviews

Diseases of Occupation and Vocational Hygiene.—Kober, George M., M. D., LL. L., Washington, D. C., and Hanson, William C., M. D., Belmont, Mass. P. Blakiston's Son & Co., Philadelphia.

The entire subject of occupational diseases is covered in this volume of special interest to Ophthalmologists is the chapter on Occupational Diseases of the Eye by Würdemann and Glass Workers Cataract by Legge. Würdemann has classified his chapter under (1) accidental injuries discussing in detail, under etiology, the manner in which the different types of accident are caused. He covers a wide realm of industries under this heading. The various objects causing ocular injuries and their common result are described.

The bacteriology, traumatism, mechanism of special types of injuries, prophylaxis of injuries to eyes, protective legislation, diagnosis of injuries, the relation between accidental injuries and previously intercurrent and post-traumatic changes in the eye, the responsibility of the physician, and conservation of the wounded eye are sub-divisions each of which is fully discussed.

(2) Diseases due to occupation incurring excessive eye strain includes nystagmus and muscular unbalance, myopia, etc.

(3) Diseases due to excessive exposure to light and heat.

(4) Toxicology, systemic poisons causing loss of sight as Arsenic, Amyl Alcohol, Methyl Alcohol, Tea, Carbon Bisulphide, etc., are discussed.

(5) The estimation of economic damage closes his chapter.

He has furnished many interesting and instructive illustrations showing the cause of injuries in manufacturing plants, mines, etc. These are scattered through the volume.

Legge of London has discussed the subject of Glass Blowers Cataract extensively. He considers the subject from the sociological standpoint giving tables showing the relative occurrence in various types of glass blowers, the character of lens changes, discusses the relative impairment of vision in this in comparison to other trades, calling especial attention to the slowness of development, the good working vision during this period, the fact that the posterior fibres first become opaque.

He describes the work of Sir William Crooks and the composition of the various lenses devised to prevent the cataract. Two striking sociological problems, the prevalence of syphilis due to the

common use of the tubes in mouths for blowing, and the substitution of machines for the manufacture, he discusses in a hopeful manner.

Injuries of the ear are discussed by Blake in detail. He reviews the effect of injuries in all parts of the ear, the cause both direct and indirect, due to compression.

The book in general discusses every phrase of industrial diseases and injuries, sociological problems, the review of work done by the government in relation to this subject, social hygiene, the laws passed for prevention and compensation of injuries and various diseases caused by occupation.

George W. Swift.

Diseases of the Eye.—de Schweinitz, George E., M. D., LL. D., professor of Ophthalmology in the University of Pennsylvania. Eighth edition, thoroughly revised and enlarged. Octavo of 754 pages, 386 text illustrations, and seven lithographic plates. Philadelphia and London: W. B. Saunders Co., 1916. Cloth, \$6.00 net; half Morocco, \$7.50 net.

How great a favorite de Schweinitz's excellent hand book has become in the medical world is again vividly attested by the appearance of the eighth edition, three years after the seventh. It has been thoroughly revised with due reference to the progress of ophthalmology within the last three years, as will be especially noticed by the introduction of the following subjects: Clifford Walker' Mmethod of Testing the Visual Field; Squirrel Plague Conjunctivitis; Swimming Bath Conjunctivitis; Anaphylactic Keratitis; Family Cerebral Degeneration with Macular Changes; the Ocular Symptoms of Disease of the Pituitary Body; Sclerectomy with a Punch (Holth's Operation); Preliminary Capsulotomy (Homer Smith's Operation); Iridotaxis (Borthen's Method); Thread Drainage of the Anterior Chamber (Zorab's Operation); Extraction of Cataract in the Capsule After Subluxation of the Lens with Capsule Forceps (Stanculeanu's Method, Arnold Knapp's Method); Capsulomuscular Advancement with Partial Resection (Ziegler's Method); Tenotomy of the Inferior Oblique; Window Resection of the Nasal Duct (West's Operation); autotoxemic iritis and iritis secondary to mucous membrane infections, a chapter to which the author has largely contributed by very valuable publications.

We cannot quite agree with the author when he mentions exclusively high (malignant) myopia under the causes of detachment of the retina. Although the predisposition to detachment of the retina increases with the degree of myopia, it also exists in milder degrees, as shown by numerous observations and statistics and also

recently emphasized by Leber in his great work on the diseases of the retina. With regard to physical exertion, signified by de Schweinitz as cause of sudden appearance of detachment of the retina, Leber, in concordance with Pfalz, for years maintained in expert testimonies that an etiological connection between physical exertion or strain and detachment of the retina has not been proven or even been rendered probable by clinical experience and anatomopathological findings.

Under the methods of testing the color-sense we miss the enumeration of the very useful plates of Nagel, and the anomaloscope of Nagel, which allows of a more exact diagnosis.

The introduction of the equivalents in the metric system of the doses of remedies and concentration of solutions will be welcomed as a timely innovation. The description of Elliot's corneo-scleral trephining and Sweet's revised method of localizing foreign bodies within the eye by Roentgen rays have been written by their originators, and the section on sciascopy, as in previous editions, has been prepared and revised by Edward Jackson. A number of new illustrations have been inserted. The entire work has been reset and appears in a new and greatly improved form, and will be sure of the highest appreciation.

C. Zimmermann.

The Catarrhal and Suppurative Diseases of the Accessory Sinuses of the Nose.—Skillern, Ross Hale, M. D. Two hundred eighty-seven illustrations, Philadelphia. J. B. Lippincott Co., second edition, 1916.

This strikes one, at once, as having been written by one who knows the subject from a practical standpoint. The fact that the first edition was speedily exhausted, and the second edition already in print, shows that the author's efforts were duly appreciated. The book is well illustrated, and the technic involved in the various operative procedures is given in detail.

Part 1 deals with general considerations. The examination of the nose for sinus disease; anatomy of the lateral wall of the nose; development of the accessory sinuses; normal mechanism of drainage, physiology; bacteriology and pathology.

General Etiology is dealt with in a comprehensive manner. The first part, also, contains discussions on the cause of chronicity, pathological changes in the mucous membrane of the sinuses and complications of chronic inflammation.

Diagnosis by means of Transillumination (2) Roentgen Rays (3) Suction and (4) Tuning Fork, is taken up thoroughly in relation to each sinus. The Maxillary Sinus is taken up in great detail

in Part 2. Frontal Sinus is taken up in Part 3; Ethmoid Labyrinth in Part 4, and the Sphenoid Sinus in Part 5.

The author has revised the first edition, making corrections and adding a great deal of new matter.

The subjects more fully described, include the treatment of sinus diseases in children: the use of naso-pharyngoscope in diagnosis of obscure conditions in the posterior, ethmoid and sphenoid regions. The diagnostic needle puncture of the maxillary sinus is more fully explained with possible dangers and how to avoid them.

Frederick Adams.

Senile Cataract.—Woodruff, Harry, M. D., Chicago.

Anyone who wishes to inform himself thoroughly regarding the best present day methods of senile cataract extraction can do no better than read the little book entitled "Senile Cataract," edited by Harry Woodruff, M. D., of Chicago.

As stated on the title page this book is a symposium on the extraction of senile cataract, being a complete report of the papers and discussions presented before the Chicago Ophthalmological Society, Nov. 20, 1911. Although now five years old, very little has been added to our knowledge on the subject since these papers were read. A good idea of the subject matter can be gotten from a glance at the synopsis of contents:

Chapter I. The Preparation, Thomas Faith, M. D. Discussion, Wm. E. Gamble, M. D.

Chapter II. The Incision, Wm. H. Wilder, M. D. Discussion, Oscar Dodd, M. D.

Chapter III. The Iridectomy, Casey Wood, M. D. Discussion, Willis O. Nance, M. D.

Chapter IV. The Capsulotomy, W. A. Fisher, M. D. Discussion, Harry S. Gradle, M. D.

Chapter V. The Delivery of the Lens, Derrick T. Vail, M. D. Discussion, Richard J. Tivnen, M. D.

Chapter VI. The Toilet, Chas H. Beard, M. D. Discussion, E. J. Gardiner, M. D.

Chapter VII. Complications and After Treatment, D. W. Greene, M. D. Discussion, Cassius D. Wescott, M. D.

Chapter VIII. General Discussion, Oliver Tydings, M. D.; W. Frank Coleman, M. D.; George F. Suker, M. D.; Heman H. Brown, M. D.; Henry B. Young, M. D.

The names in this list are familiar to all of us and each has treated his particular subject clearly, concisely, and at the same

time comprehensively, the various papers being also well illustrated with drawings of operations, instruments, etc. In addition the editor has appended many well chosen comments and the whole is arranged to make extremely interesting and instructive reading.

Richard J. Tivnen, in discussing Vail's paper on "Delivery of the Lens," takes up the relative merits of the Smith and capsulotomy methods of extraction and gives opinions received from 160 ophthalmologists throughout the country, sufficient for a fairly accurate conception of the general attitude on this subject in the U. S. Many good men attempt intracapsular delivery by the Smith method or its modifications and if the lens does not present on moderate pressure the operation is finished by capsulotomy.

It would take entirely too much space to outline the different papers but they all represent years of experience by leading men and I know of nothing in this line which is better worth reading than the little book "Senile Cataract," edited by Woodruff and published by the Cleveland Press at Chicago. A. F. Mattice.

The Ophthalmic Year Book, Volume XII—Containing a Digest of the Literature of Ophthalmology for the Year 1915.—Jackson, Edward, M. D., Sc. D.

The appearance of the year book again demonstrates the untiring efforts of the editor-in-chief and his eighteen assistant editors in behalf of American Ophthalmology. The members at large will welcome this review of the work being done all over the world in the advancement of our special branch of medicine. In the preface the editor mentions the results of the war upon our foreign literature. Also the lack of proper valuation as to the importance of the knowledge gained by the study of injuries of trench warfare.

Each subject has been carefully edited, brief mention of the less important articles, more elaborate reviews where the authors advanced new theories or conclusions. A complete reference index, both as to name of authors (biography) and articles, close the volume. The year book, while not in any sense a cyclopedia for Ophthalmic literature, places within the reach of all a rather complete review of the year's literature. The editors are to be congratulated on this edition.

George W. Swift.

Cerebellar Abscess.—Friesner, Isidore, M. D., Adjunct Professor of Otology and Assistant Aural Surgeon, Manhattan Eye, Ear and Throat Hospital and Post Graduate Medical School, New York; and Alfred Braun, M. D., F. A. C. S., Assistant Aural Surgeon, Manhattan Eye, Ear and Throat Hospital, Adjunct Professor of Laryngology, New York

Polyclinic, etc. 186 pp., 26 illustrations, including 10 full page plates, \$2.50. Paul B. Hoeber, New York, 1916.

This is a very complete monograph of special interest to the otological surgeon as over ninety per cent of cerebellar abscesses are of otitic origin. The anatomy and physiology of the cerebellum are well covered in the first two chapters. The remaining chapters are devoted to the etiology, pathology, diagnosis and treatment of cerebellar abscess. The recent advances made in our knowledge of cerebellar physiology and methods of diagnosis and of the relationship between the cerebellum and the static labyrinth are particularly well covered. The relationship between the cerebellum and the static labyrinth is described at length and should be of interest to the neurologist as well as the otologist. C. Benson Wood.

Obituary

Boleslaus Wicherkiewicz, Geheimer Hofrat, Professor of Ophthalmology in the University of Cracow, Polish editor of OPTHALMOLOGY, died December 7th, 1915, in an Austrian Military Reserve Hospital, presumably a victim of the great European war. He was born June 7th, 1847, at Exin in Posen, and served as assistant surgeon in the Franco-Prussian war. Among his contributions to Ophthalmology were on on "Bilateral Congenital Anophthalmos" in 1878, and on "Cataract Extraction" in 1880. From that time until the last year of his life he continued to publish important papers. One of the last of these, read before the 39th Ophthalmological Congress at Heidelberg, suggested grill-like sclerotomy for Glaucoma. He was also a member of the Société Française d'Ophthalmologie and contributed to its Transactions. Most of his papers appeared in the German and French journals, especially in the *Klinische Monatsblätter für Augenheilkunde*, of which he was one of the collaborators. But his communications were numerous and widely scattered. They dealt chiefly with clinical questions, operations, and drugs used in ocular therapeutics. But few European writers have contributed so much to the literature of ophthalmology in the last score of years, or so much that was original; and upon such a wide range of subjects.

Edward Jackson.



Prof. Dr. B. W. Michener

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Original Articles.

THE "OLD" AND "NEW" CATARACT OPERATION

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I.

Colonel Newman's criticism published in the June number of the *Indian Medical Gazette*, on our article describing the new method of cataract operation published in the April number raises the important question of the best incision.

Colonel Newman says: "Morgagnian cataracts are unsuitable for the entire removal of the lens because the fluid of which they are so largely and occasionally entirely composed will run out of the smallest wound; the nucleus is equally completely, more easily, and *far more safely* removed through a small corneal incision (linear extraction) through which the capsule is also easily washed out." He says, "An exactly parallel illustration up to a certain point is the employment of a suprapubic incision for a large ovarian cyst, in place of splitting up the abdomen from pubes to sternum."

A discussion on the subject will be useful.

Site of Election for Incision in Cataract Extraction.

We think that a very large incision (about $\frac{2}{3}$ or even $\frac{3}{4}$ of the circumference of the cornea) should be made in all cataract operations irrespective of the method adopted in lens extraction. It should be large even when capsulotomy is performed for reasons given below. It is incorrect to suppose that in entire removal of the lens the reason for making a large incision is that the lens will not come out through a smaller one.

For lenses in which the nucleus has not formed and the cortex is fluid an *extremely* small incision can be made.

The eye ball is held in its position in the orbit by the structures surrounding it (Optic nerve, Posterior Ciliary vessels and nerves, Suspensory ligament, Fascial slips from Tenon's capsule, Conjunctiva, the external muscles and Orbital fat). The conjunctiva is

very loosely attached to it in front but may give some support as it is attached to the lids and some fibres of the *Levator Palpebrarum* are inserted into it at the upper fornix. The optic nerve has a S shaped curve and cannot exert any force until it is taut. The eye ball is not directly connected to the orbit by fascia but indirectly by the fascia which covers the external muscles. There is a lymph space between the sclera and the capsule of Tenon (*fascia bulbi*) which is traversed by delicate bands of connective tissue extending between the capsule and sclera. The fascial sheaths of the muscles give off expansions to the margins of the orbit which limit their action. The capsule of the eye ball is allowed free movements of rotation and can be displaced forward or backward. Its weight is supported below by the suspensory ligament.

Atmospheric pressure, the recti and the conjunctiva press the eye ball backward and the orbital fat and obliques forward. If the orbital fat be deficient the eye ball will sink in the orbit as is seen in cases of cholera where the orbital fat is depleted of its fluids. If tenotomy of the recti muscles be performed there is exophthalmos.

The capsule of the eye ball is fibrous and inelastic in normal conditions. It cannot be stretched but it can be made to collapse.

The forces which tend to cause depression of the capsule are :

1. Pressure from the external muscles.
2. Pressure from the orbital fat.
3. Atmospheric pressure. .
4. Gravity.
5. Backward pressure from the conjunctiva.

The factors which tend to keep the capsule in shape are :

1. Intra ocular pressure.
2. Toughness of the capsule.
3. The conjunctiva and the indirect fascial connections of the eye ball with the orbit. These structures act with or against gravity according to the position of the eye.

The factors which tend to depress the capsule and those which tend to keep it in shape balance each other in normal eyes. Should the latter become weaker than the former the capsule will collapse as is seen in soft eyes after cataract operation. Should they become stronger the capsule cannot in normal conditions distend as it is unyielding but if from disease it loses this character it may distend as in hydrophthalmos.

If intra ocular pressure becomes very great a normal capsule will rupture as in staphyloma in the ciliary region.

The intra ocular pressure is distributed equally to all parts. The lower part of the capsule receives the weight of the fluids in addition. The extra capsular pressure consists of different forces and parts of the capsule are pressed on to varying degrees. The recti are arranged in bands, the orbital fat does not cover the whole of the capsule of the eye ball, and the atmospheric pressure acts on its front part only. If intra capsular pressure at any spot becomes less than the extra capsular, that spot will become depressed. If the capsule of the eye be depressed and at the same time the forces which keep it back (the atmospheric pressure and the recti) be weaker than the forward pressure of the orbital fat there will be exophthalmos as well as collapse of the capsule as in tumors of the orbit behind the eye ball.

Three degrees of reduction in intra ocular pressure may be considered:

1. Softening of the eye ball where the pressure still remains greater than the atmospheric. This is found in the soft eyes of myopes.

2. Softening of the eye ball where intra ocular pressure becomes equal to the atmospheric as at the time of operation, on senile cataract. Extra ocular pressure causes some collapse of the capsule of the eye ball. Reduction in the backward pressure from relaxation of the recti causes a certain amount of exophthalmos. This is specially marked in cataract extraction by large peripheral incision, in which the front part of the eye ball is not depressed as intra ocular pressure is almost equal to the atmospheric.

3. Where intra ocular pressure becomes less than the atmospheric. In this case the atmospheric pressure also depresses the front part of the eye ball. This is seen in cases of phthisis bulbi.

The capsule of the eye ball is pressed on to different degrees at different parts and is therefore liable to be depressed unequally when the eye ball becomes soft. The spots which are specially liable to depression are:

1. The line running across the cornea and sclerotic in front of the insertions of the internal and external rectus.

2. The line running across the cornea and sclerotic in front of the insertions of the superior and inferior rectus.

3. The line running across the sclerotic behind between the insertions of superior and inferior obliques.

4. The parts covered by the orbital fat.

5. The part exposed to atmospheric pressure.

6. In upward extractions of the lens the upper part of the

capsule by the action of gravity is seen to flatten the upper margin of the wound and cause overriding of the corneal flap when the intra ocular pressure is equal to the atmospheric. In conjunctival flap operations a moderate rise in intra ocular pressure takes place soon after operation. The upper part of the capsule of the eye ball is thus supported against gravity.

To prove that the above is true we would take the case of phthisis bulbi. In this condition we find one groove running in the horizontal plane another in the vertical plane of the eye ball in front. The continuity of these may be interrupted on the corneal surface if it is not sufficiently soft from atrophy, otherwise we find the depressions continuous across the cornea from one side to another. The reason why the cornea sometimes escapes a depression in these lines is that it is more tough and therefore less depressible than the sclerotic, and the constricting bands of the external muscles cannot actually depress it though the depressing force is present. These grooves run between the points of insertions of the internal and external and of the superior and inferior rectus in front and are the result of the force resulting from the tonic condition of these muscles. The eye ball also shows a flattening in front greater above than below. This is the result of atmospheric pressure and gravity. If we excise the eye and look at the posterior part we see the flattening caused by the presence of the orbital fat and a depression between the insertions of superior and inferior oblique resulting from the action of these muscles.

These eyes show how extra capsular pressure acts in bringing intra ocular pressure up to the atmospheric in disorganized and soft eye balls by depressing the collapsible capsule at the spots pressed upon. The obliques, the orbital fat and the fascial expansions tend to keep it forward. The continuity and depth of these grooves are also influenced by symblepharon or adhesion of the conjunctiva to the eye ball. These grooves also suggest the idea that if curvature of the cornea be greater in one meridian, the external muscles acting at right angles to this meridian may make an effort to correct this by their contraction, especially when the error of astigmatism is small, and so cause eye strain. Cylindrical glasses will relieve this extra effort of the external muscles.

The capsule of the eye ball is tough but very depressible—specially in the region of the sclerotic therefore there cannot be much difference between the intra and extra capsular pressure when the capsule is collapsed as any difference in pressure one way or the other can further change the shape of the capsule.

When the eye ball is full and at its maximum capacity the intra ocular pressure can rise above the extra ocular without causing distension of the capsule or without obliterating the angle at the junction of the segments of the two spheres of which it is composed. If we take the capsule to be easily depressible the pressure inside the eye ball must either be equal or greater than the pressure outside at all spots in normal conditions. It cannot be much less or the capsule will be depressed and lose its shape. Very slight excess in extra capsular over intra capsular pressure may not depress the capsule on account of its toughness.

In cataract extraction by any method we make an incision in the capsule of the eye and remove its diaphragm. In this way the interior of the eye ball communicates directly with the atmosphere and the intra ocular pressure is reduced until it becomes almost equal to the atmospheric.* The extra capsular pressure will depress the capsule until it is also equal to the intra ocular. The capsule of the eye ball is not being pressed on by a dead weight. The pressure exercised by the external muscles and orbital fat diminishes with the collapse of the capsule.

As the intra ocular pressure after incision is not less than the atmospheric the front part of the capsule of the eye cannot be depressed inwards. But it is liable to be so depressed if the intra ocular pressure becomes negative and air cannot enter the eye ball. What we have said is what actually happens and what is seen at the time of operation.

We see that although the contents of the eye ball have partly escaped it is still full. This means that the containing capacity of the eye ball has diminished. This could happen from elastic recoil of the capsule but we know that it is inelastic and cannot recoil. The only other way in which the containing capacity can diminish is by the departure of the capsule from a spherical shape.

We know that a sphere is the geometrical figure that encloses the largest amount of cubic space for a unit surface area.

This change in the figure of the eye ball without any diminution in the surface area means unequal depression of its capsule which in turn is the result of unequal compression.

The proof that the sclerotic is depressed in the way indicated by us is to be found in the means adopted by the surgeon to cause negative pressure. Whatever these means may be they all aim at restoring the capsule of the eye to its original spherical shape and thereby increasing its containing capacity. The forces result-

ing from these means act on the sites where the capsule is depressed.

Very large incisions reduce the extra capsular pressure on the eye and therefore cause less alteration in its spherical shape or containing capacity.

The proof of this is to be found in actually seeing at the time of operation that the wound does not gape and the contents do not escape to the same extent as with small incisions. Complications for the same reason are rare.

The reasons why a large incision should have this effect are:

1. The antagonistic external muscles of the eye ball engage each other by their tone and produce the forces which press on the eye ball as shown above in cases of phthisis bulbi.

If an incision be made in the eye ball and the lens diaphragm removed the tone of the muscles at right angles to the incision diminishes, pressure from them on the eye ball becomes less and they relax. If the incision be enlarged on either side so as to break the continuity of the capsule in the line of action of the other set of muscles they will also lose their tone and relax thereby causing less pressure.

If $\frac{2}{3}$ or $\frac{3}{4}$ of the circumference of the cornea be cut in this way the four recti will be relaxed, the antagonistic muscles releasing each other.

2. We have shown that atmospheric pressure, the recti and the conjunctiva press the eye ball backwards and prevent it from protruding and the orbital fat and obliques prevent its sinking in the orbit. A large incision while it has rendered the recti weak has not interfered with the action of the obliques. The eye ball therefore protrudes slightly or in other words there is some exophthalmos. This relaxes the obliques and pressure from the orbital fat and reduces the S shaped curve of the optic nerve.

It will be seen that in a very large incision the spherical form of the eye ball is less altered as the extra capsular pressure is more reduced than with a small incision. For the same reason the containing capacity of the eye ball is diminished less in cataract extraction by large incision.

Four kinds of incisions generally are made by surgeons in cataract extraction.

1. An extremely small incision. This is similar to the puncture made in lens couching or in needling cataracts which have fluid cortex and no nucleus as found in children. In this operation the extra capsular pressure is least interfered with but the wound

is so small that vitreous cannot escape through it. This incision is therefore not bad.

2. Radial incision. This is practically never used by any surgeon though Colonel Smith calls his incision a practically radial one. Captain McKechnie has proved that with this incision there is comparatively less gaping than in a flap incision. In this the extra capsular pressure is considerable. This will reduce the containing capacity of the eye ball and tend to expel its contents. For want of sufficient gaping, lens extraction especially in the capsule will be difficult and even if it be admitted that the manipulations suggested by Smith solve this difficulty the danger of expulsion of vitreous and iris will still be great when the lids are released before dressings are applied. The wound may not gap so much as in corneal flap incision but if it can allow the lens in its capsule or even its nucleus to pass, it can surely allow vitreous to escape or iris to prolapse. The function of dressings is therefore very important with this incision. These cover the wound in front and help to a certain extent to keep the vitreous back.

3. A small corneal flap. This incision is being used by practically all surgeons throughout the world. Smith himself makes it, though a forward one as is shown in this paper later on. We call an incision small when the corneal flap is in direct continuity with more than one rectus.

In this incision extra ocular pressure is reduced but not sufficiently and so expulsion of contents and gaping can occur. The function of dressings is even more important in this case than in the former.

4. A very large peripheral incision. In this the extra capsular pressure is much reduced and the containing capacity of the eye ball least interfered with.

The whole question of the best incision for cataract extraction depends on whether it is better to operate on an eye with a comparatively undiminished, or on one with a diminished containing capacity.

Let us now compare the advantages and disadvantages of large and small incisions.

Large Incision.

1. A large incision can be made to gap more at the time of operation with less pressure than a small one so extraction requires less pressure.

2. The lens capsule is not in danger of rupture in the process

of extraction, as the lens is not much compressed with the strabismus hook or between the sharp margins of the cut cornea.

3. The cut margins of the cornea, the ciliary processes and iris are not bruised by the lens nor is the iris pressed between the sharp margins of the cornea. Striped keratitis is therefore less.

4. A better view of the interior of the eye ball is obtained.

5. Those who have not the manipulative skill for ordinary lens extraction can easily pick out the lens with capsular forceps one blade of which is passed behind and one in front of the lens. In the same way the lens can quite easily be removed entire without iridectomy in downward extraction. We adopt this procedure when the lens is adherent to the iris in cases of posterior synechiae.

6. A large incision ensures comparative rest for the eye ball during the time the wound remains ununited. It is more useful in corneal incision from this point of view than in the conjunctival flap operation because in the former the union takes longer.

In upward or downward extraction the cornea is cut in the upper or lower part, the continuity of the eye ball is thus broken in the vertical meridian of the cornea. The external muscles of the eye like other muscles in the body act better when they are in a tonic condition and the force of contraction varies according to the resistance offered. Each rectus engages its antagonistic muscle. When the continuity of the eye ball in the vertical meridian is broken the superior and inferior recti lose their grip and release each other to a certain extent. The resistance to both of them is reduced, and they relax. If we make the flap so large that the incision goes beyond the plane of action of the internal and external rectus we make these muscles release each other and they relax, practically all the muscles of the eye ball are thus reduced in tone. So the rotatory movements of the eye ball become more difficult. The softened eye ball will change its shape from the action of muscles attempting to rotate it. This change will further relax the muscles making rotation still more difficult. This is how a large incision in cataract operation ensures comparative rest for the eye ball.

This relaxation cannot be obtained to the same extent if the diaphragm of lens and suspensory ligament is intact because then the external muscles do not release their grip so much on account of their forces being transmitted to the opposite side through this diaphragm.

It is not meant that the eye ball cannot be rotated *at all* with large incision in cataract operation.

7. The pressure from outside imparted to the capsule of the eye ball is considerably reduced when the lens diaphragm is removed therefore the complications resulting from diminished cubic capacity are less.

8. For the same reason the deviation of the eye ball from a spherical figure is not so great as it would be if any one set of muscles was unrelaxed, because in the latter case there would be greater compression of the eye ball between the recti and the orbital fat and less exophthalmos. Less deviation from a spherical form means less diminution in containing capacity and therefore less compensatory gaping or none at all, as any slight diminution in cubic capacity can be compensated for by the vitreous occupying the space vacated by the lens and aqueous.

9. As gaping is less the complications resulting from it will not occur.

(a) Prolapse of the iris subsequent to the operation will not occur as the front surface of the vitreous will not mould into a *prominent* pyramidal shape, the pressure from outside being much less. The iris will therefore not be thrown towards the periphery by the slippery pyramid of vitreous.

(b) Escape of vitreous at the time of operation will not occur on account of the greater containing capacity of the eye ball.

(c) There will be less danger of infection (iritis, suppuration, etc.) from the gaping of the wound. There is no doubt that a large wound will gape more for the same amount of intra ocular pressure than a small wound, but in large wounds the pressure itself is considerably less as shown above. Suppurating eyes are generally found to have gaping wounds. This may be the result of suppuration but we think it is oftener the cause of it. Gaping precedes suppuration.

(d) Pain, irritability of the eye, lachrimation, redness and post operative glaucoma are usually the result of:

1. Reaction from cocaine and adrenaline.
2. Bruising of ciliary processes.
3. High pressure on the wounded parts either from dressing and lids or intra ocular tension.
4. Spasm of the external muscles from irritation at the time of operation and after, or from the reaction of cocaine and adrenaline.
5. Interference with intra ocular circulation by a too forward position of the vitreous making the anterior chamber shallow and blocking the iridic angle.

6. The pressure used at the time of lens delivery.
7. Inflammatory complications as iritis, cyclitis, suppuration, etc.
8. Linear corneal ulcer seen in corneal incisions when dressings are removed.
9. Ciliary congestion and conjunctivitis.
10. Acidosis.
11. Incarceration of vitreous lens capsule or iris in the wound.

12. Eye strain; patients who suffer from eye strain or whose eyes show signs of irritation, lachrimation, conjunctival irritation before operation are liable to suffer from irritable eyes after operation.

Most of these troubles are found with small incisions in the eye ball. In larger incisions the muscles are relaxed and they cannot go into spasm so easily, nor can the spasm of one muscle affect its antagonist to the same extent as in smaller incisions. There is less interference with intra ocular circulation as the pyramid of vitreous is less prominent. There is therefore less congestion of the ciliary muscle, ciliary processes, chorioidal and retinal blood vessels and the conjunctiva. The redness of the conjunctiva is not caused so much by the large size of conjunctival flap as by the blocking of the circulation in small incisions. Diffuse redness of the conjunctiva is an attempt of nature to drain away the blood from the congested ciliary muscle. It is a common experience to find the cases operated on complaining of pain when the conjunctival redness is passing off and only injection in the circum-corneal zone is visible. The pain passes off when conjunctival redness is produced again by a sub conjunctival injection of sugar solution or yellow ointment or dionin lotion drops.

Less pressure is required at the time of lens delivery than in smaller incisions and above all the injured eye gets greater rest.

In small incisions there is not only greater pressure used at the time of operation but there is also greater pressure on the eye ball from the external muscles, the lids and dressings.

In corneal incisions the linear corneal ulcer described by us before makes conditions worse.

Irritable eyes cause blepharospasm and establish a vicious circle, as blepharospasm causes greater pressure on the eye ball. It is better in these cases to cut the orbicularis palpebrarum at the outer canthus.

If a patient is not operated on the same day he is prepared with cocaine and adrenaline he gets severe pain that night while those who have been operated on the same day as prepared are comfortable. This appears to be due to the reaction of cocaine and

adrenaline causing catarrh of the conjunctiva, spasm of the external muscles of the eye and of the ciliary muscle. In eyes operated on there is no spasm and therefore less pain or none at all. If these postponed cases are operated on the following day, vitreous will be more likely to escape on account of spasm of the external muscles. More cocaine will also be required to produce anaesthesia as the eyes are tender to start with.

(c) *Astigmatism.*

This will be less with large incisions because:

1. The margins of the wound are restored to their natural circular curve.

The cornea and sclerotic have different degrees of toughness therefore they behave differently to the same degree of force acting on them.

The pressure from the tonic condition of the internal and external rectus causes the corneal flap to stick out more than the sclerotic, which is more easily depressed by the same force than the cornea as is seen in cases of phthisis bulbi.

Large incisions relax all these forces and the pressure from the internal and external rectus cannot be transmitted directly to the corneal flap, therefore the cut margins resume their circular curve. In upward extraction gravity will still keep the upper margin of the wound comparatively flatter so long as intra ocular pressure is equal to the atmospheric. When it is greater than the atmospheric though still short of normal the upper margin of the wound will get an extra support from it.

The malunion and overriding of the corneal flap, which is usually found both in upward and downward extraction with small incision will be much less or absent. We reported some cases of fairly high astigmatism in our article on "Eye Strain." These cases were operated on at a time when the value of *very* large incision was not clearly understood.

2. There is less gaping of the wound. Gaping is greater in smaller incisions because the internal and external rectus keep each other engaged and therefore press more on the eye ball in the line of their action and give the cornea greater support in the horizontal axis. The wound gaps partly on account of the resultant of the two forces acting directly on the cornea and making the flap stick out, and partly by the flap being lifted up by the forward dislocation of the vitreous from the diminished containing capacity of the eye ball.

3. There is no vitreous loss. Eyes which have become smaller from vitreous loss have high hypermetropia and astigmatism.

4. There is no incarceration of iris or vitreous.

(f) In conjunctival flap operations the danger of cystoid or filtering cicatrices does not exist as there is no gaping. This is a complication of small incisions in the eye ball with the conjunctival flap.

If an incision is made about half the circumference of the cornea with a preliminary conjunctival flap in upward extraction and the dressings are removed early the conjunctival flap may slip down a little from the action of gravity and a filtering scar may form. Blinking movements of the upper lid tend to make the corneal flap turn over forwards at the line of its attachment to the eye ball, that is the horizontal axis of the cornea. A groove may be visible on the front of the cornea at the base of the corneal flap running from side to side. This is the result of the constricting bands of pressure in the horizontal axis of the cornea caused by the tonic action of the external and internal rectus. It is specially noticed when the base of the corneal flap coincides with this line and is not seen when the incision is larger or smaller.

This trouble is overcome by making a large incision, extracting the lens downwards or using a pressure bandage in upward extraction. In addition a snip may be made in the conjunctival flap to let out the aqueous and lower the tension of the eye. In downward extraction gravity helps to keep the corneal flap in position.

If the incision be made obliquely through the thickness of the cornea it will have the further advantage that even a considerable rise in intra ocular pressure will not make the wound gap. If a very large incision is made it need not be oblique.

10. Relaxation of the muscles at the time of operation brings a troublesome patient under better control as the eye ball cannot be so easily rotated.

11. In the case of a small incision the lids and dressings have a very delicate and important function to perform. The lids and dressings prevent the gaping of the wound. In large incisions the eye ball behaves properly without their help.

12. The union of the wound *must* occur before any considerable rise in intra ocular pressure can take place. So long as union has not occurred the external muscles will remain lax; and after firm union has occurred a rise in intra ocular pressure can do no harm. We know from experience that an eye remains soft for a few days after operation; and while this is so the intra ocular

cannot be much higher than the atmospheric pressure. Intra ocular tension is chiefly due to the blood pressure in the eye ball, but this alone is not sufficient to restore the tension of the eye ball completely as is seen when its contents have escaped in large quantities. The eyes we know become soft and small.

The conjunctival flap is held in position by atmospheric pressure on the one hand and intra ocular pressure on the other, and so long as the latter is not considerably above the former it cannot draw away the conjunctival flap and make the wound gap, as it has to overcome the friction between the flap and eye ball. We know that a conjunctival flap is glued to the eye ball a few hours after operation, so it is more than friction alone that keeps it in position. Immediately after the operation and for a short time afterwards the flap is kept in position by friction only; and sticks to the eye ball as a thin piece of wet paper sticks to a wall. The eye remains soft for a few days after operation, and so the conjunctival flap gets ample time to become firmly adherent. For this reason no filtering or cystoid cicatrix can form subsequently even if the dressings are removed early in downward extraction. The cut margins of the eye ball will remain in apposition like the conjunctival flap.

12. Should a sudden rise in intra ocular pressure take place from pressure of the lid or a blow from the patient's hand before union has occurred, the compensatory gaping of the large flap will be enormous and no expulsion of contents or incarceration of iris can occur. The gaping will disappear with the disappearance of the increased pressure but the conjunctival flap may or may not readjust itself.

13. The retina is inelastic so it cannot detach itself in a softened eye. When a large incision is made, the movements of the eye ball are restrained for the reasons given above, and there are fewer jerks and less splashing of the vitreous. There is also less deformity and fewer elevations and depressions in the coats of the eye, and therefore less danger of detachment of the retina. We know from experience that the retina does not get detached in these cases the above is the explanation of its non-occurrence in soft eyes after cataract operations. These soft eyes differ markedly from the soft eyes found in myopia in which detachment of retina is said to occur. In the latter the continuity of the eye ball is not broken and the external muscles act powerfully and cause jerks and splashing of the vitreous. When the eye has normal tension the contraction of the external muscles will roll it about without

actually *depressing* the sclerotic to an appreciable extent, but not so in the soft eyes of myopes. This explains why detachment can occur in myopic eyes but not so easily in the soft eyes of aphakia and eyes with normal tension

14. As no filtering scar forms in large incisions and the wound unites quickly the intra ocular pressure reaches normal sooner without dressings than in the case of smaller incisions, there is less danger of intra ocular hemorrhage from want of support to the blood vessels and the dressing can safely be removed early. Soon after the flap is put in position in conjunctival flap operations, the intra ocular pressure becomes slightly higher than the atmospheric, but this cannot draw away the flap on account of friction between it and the eye ball. This moderate rise in the tension of the eye ball gives support to the blood vessels and to the upper margin of the wound against gravity in upward extraction. The pressure caused by it is not high enough to produce pain. With small incisions the external muscles press more heavily on the eye ball and this would increase the tension if there was no compensatory gaping and expulsion of contents to lower it. In corneal incisions the ocular tension will remain almost equal to the atmospheric pressure so long as the interior of the eye ball communicates with the air through the wound. Dressings close the wound in a very irregular and uncertain way as we know that gushes of aqueous can take place in spite of the dressings. We admit that dressings do give support to the blood vessels, but it is not so satisfactory in corneal incisions alone as when they are combined with a conjunctival flap. If no dressings be applied in corneal incisions the eye ball will remain very soft and there will be danger of infection, expulsion of contents and hemorrhage. A pressure bandage renders the eye soft although the blood vessels get support during the time the dressings are actually on. When the dressings are removed there is danger of hemorrhage until the eye has regained its normal tension. The danger of intra ocular hemorrhage cannot be less with small incision, in fact it is greater as the contents of the eye ball are more liable to be expelled in large quantity from the action of the external muscles. These do not always remain contracted. They relax during sleep thereby increasing the capacity of the eye ball and as the expelled contents cannot be restored, the eye ball will become very soft and the blood vessels will have less support from the vitreous. This is why intra ocular hemorrhage often occurs in these eyes in the early morning when the patient yawns and stretches himself

before the external muscles recover their tone. Intra ocular hemorrhage often takes place at night even in eyes not operated on. This occurs when the patient gets up in a half sleepy condition to pass urine or for any other purpose. In small incisions the gaping of the wound may disappear and the margins come into apposition during sleep on account of relaxation of the muscles.

Smith in his operation rightly advises closure of the eyes when vitreous begins to escape, because with the covering of the lids the external muscles tend to relax, the upper fornix of the conjunctiva closes and the space outside the eye ball is obliterated. If vitreous begins to escape at the time of operation our advice is, to try to produce negative pressure by pulling on the conjunctival flap. This will nearly always be successful in causing the vitreous to recede, but if not successful in any particular case close the lids by all means and apply dressings.

In Smith's operation, which is a corneal flap operation in which the incision is more forward than at the corneo scleral junction, the removal of dressings before the wound has united is dangerous, as when their support and that of the lids is removed the wound may gap and expulsion of contents hemorrhage or entrance of infection take place. For this reason the dressings cannot be changed for at least 10 days. Smith never makes an ideal radial incision. He makes a regular flap or peripheral incision but calls it a practically radial one. He confounds a radial incision with a forward peripheral incision of the cornea. A peripheral incision need not necessarily be situated at the corneo scleral junction. It can be forward in the cornea and peripheral at the same time. We make the above remarks on the strength of Smith's own description of his incision in his book on the Treatment of Cataract figure 24. The incision recommended by him is smaller than the one advocated by us.

In order to get a rough idea as to what is meant by a radial incision one should look at the meridians and other lines on a geographical globe.

The only difference in large and small incisions, so far as softening of the eye ball is concerned immediately after operation, is that while the eye gets soft in both, in one it is without either gaping or loss of vitreous and in the other it is with gaping or even expulsion of the vitreous, causing greater softening during the time the external muscles are relaxed. Atmospheric pressure will bring the intra ocular tension up to its own by flattening the

sclerotic and the cornea in front when the contents have escaped in large quantity.

15. As the whole conjunctival flap and the cut margins of the cornea are in apposition and begin to unite practically *at the same time* the future curvature of the cornea is *permanently* settled much sooner than with smaller incisions where the cut margins are not in apposition and there is gaping. Therefore the patient need not wait very long for permanent glasses after operation by large incision.

16. An adherent conjunctiva gives support and pressure to the eye ball like dressings with the additional advantage that the patient can see. This extra pressure on front brings the tension up to normal sooner than occurs after corneal incision, reduces astigmatism by increasing the curvature of the cornea in the vertical meridian, reduces danger of hemorrhage, detachment of the retina and complications from gaping of the wound. The effect of the large conjunctival flap used by us is considerable. This flap is not loose like healthy conjunctiva even in the early stages of its union and therefore begins to give support to the corneo scleral junction at once. This is important as the corneo scleral junction is a weak part of the eye ball, being the place where the segments of two spheres unite.

It will thus be seen that ordinarily there is no danger in removing the dressings early in cataract operations as advised by us whether iridectomy is performed or not.

Iridectomy should in our opinion be a treatment of complications and not a step in the operation.

Colonel Newman thinks that the greater the trauma the greater must be the trouble to the patient, and to him it appears paradoxical when we say that the larger the incision for lens extraction the less is the trouble to the patient and the quicker the recovery. We are certain that gynaecologists prefer large incisions for the removal of large ovarian cysts and that in abdominal operations more trauma is caused by attempting to work through small incisions and being cramped for want of space than would be, if large incisions were used.

A few quotations on this question might not be out of place:

"The attention of operators cannot be called too strongly to the necessity of making incisions sufficiently long to permit of a thorough examination of all the intra abdominal organs by the hand of the operator." (Bottomley in Keen's System of Surgery, Volume VI.)

"It is difficult to say how long the abdominal incision may be made with advantage; if assistants are present who can take care that the intestine is kept well covered, the length is a matter of secondary importance and a free incision, by facilitating the further stages of the work, saves much time and therefore the patient's strength." (Urgent Surgery, Lejars and Dickie.)

"James E. Moore protests against too small incisions which are often made as a matter of pride." (Journal American Medical Association, September 16th, 1911.) (Modern Surgery, Dacosta.) We should have thought that Crile's investigations would have disposed of this matter.

Corneal Incision.

The line of incision in the cornea is its weakest part even after union has occurred. The effects of intra ocular pressure in causing an angular curvature of the cornea at this spot will be discussed later along with other points bearing on the question of, what is the best incision for cataract extraction.

II.

We have already shown that prolapse of the iris can be most easily prevented by making a very large peripheral incision. Prolapse practically never occurs with such incisions even if no iridectomy is performed, especially when a full conjunctival flap has been made. Our clinical experience and results permit us to make this statement. We have observed that it is difficult to prevent vitreous escape when a prolapse of the iris is being cut subsequent to cataract operation. A small incision does not allow prolapse of iris when the lens diaphragm is intact. When the incision is extremely small, such as a puncture with a needle or cataract knife, prolapse does not occur.

With very large incisions the use of a piece of catgut to prevent prolapse of the iris is unnecessary. Those who doubt this may conduct a few experiments on living animals. It will be found that if the cornea be completely excised under cocaine and removed altogether from the eye ball along with the lens there will be *less* danger of expulsion of contents than when the lens diaphragm is destroyed through a small incision such as the one generally used by capsulotomy surgeons. An idea on the subject may be gained by grasping an excised eye ball between the fingers, making an incision and extracting the lens. It will be noted that for the same amount

*We say almost equal because the surface tension of the vitreous and hyaloid membrane are also to be taken into account.

Note.—In some of our previous articles we used the term "elastic recoil of the tunics." By this we mean the spurious elasticity produced in the capsule of the eye by its elastic surroundings.

of pressure the vitreous will be more liable to escape from a small than from a very large incision, on account of the greater degree of compensatory gaping in the latter. It should be kept in mind that the vitreous in old patients is much more fluid than that in animals on which experiments may be conducted. In cataract extractions where a small incision is made the frequent occurrence of shallowness of the anterior chamber from forward displacement of the vitreous due to the diminished containing capacity of the post compartment of the eye ball is striking. With large incisions the anterior chamber reforms more quickly and is deeper than with small ones.

The point in favor of upward extraction was that the upper lid partly covered the coloboma caused by iridectomy. The extraction of the lens in capsule with an intact iris disposes of this and the lens need not necessarily be extracted upwards. We propose in this paper to discuss the question of the best site for cataract extraction. The following considerations guide us in selecting the site:

1. *Pressure on the eye ball.*

It is well recognized that one of the chief sources of trouble at the time of operation and during after treatment is pressure on the eye ball. The outside pressure from the hook used in expressing the lens is unimportant compared with the continuous pressure of varying degrees from the external muscles and the orbital fat, and the intermittent pressure from the forcible contraction of the orbicularis. Intra ocular pressure may cause trouble in cases of increased tension or even with normal tension if the parts pressed upon are irritable and tender. Post-operative glaucoma appears to us to be extremely rare.

We have shown before that a large incision relaxes the rotatory muscles of the eye ball and the resulting exophthalmos reduces the pressure from the orbital fat. The question now is how to deal with the orbicularis during operation and after-treatment?

2. *The collection of tears at the time of operation.*

In the usual position of the patient at the time of operation the tears flow from the upper and outer corner of the orbit along the outer surface of the eye ball to the space in the lower fornix. When this space is filled the tears reach the inner canthus and run down the cheek or pass into the nose. This fluid, if it reaches the wound, increases the danger of infection unless the conjunctival sac is absolutely sterile. We pointed this out in our paper on downward extraction. The field of operation should, as far as possible, re-

main dry, a condition impossible to obtain when the cortical matter is washed out after capsulotomy.

3. *Mechanical obstruction to manipulation at the time of operation.*

The overhanging position of the eye brow and obstruction from the nose are to be considered in this respect.

4. *The nature of different parts of the conjunctiva.*

It is thicker and comparatively more fixed on the inner side.

5. *The danger of sepsis from proximity of parts that are difficult to keep clean.*

The position of the nasal and lachrymal ducts and caruncle at the inner canthus and the lachrymal gland at the upper and outer corner deserve consideration.

6. *Astigmatism.*

We have shown that a certain amount of astigmatism is the result of disappearance of the lens diaphragm and is independent of the incision. It is found in cases of lens couching. This astigmatism is generally the result of increased curvature in the horizontal axis of the cornea. The question arises: is it possible to reduce this by incision?

7. *Interference with wound and flap from movements of the lids and eye brow during after-treatment.*

The movements of the lids take place in the vertical direction only. The orbicularis is fixed at the inner side and here its action is very defective. It is most powerful in the neighborhood of the external angular process, fairly strong below and weak at the outer canthus.

8. *The effect of gravity.*

The possible sites for incision are:

- (1) Upper part of cornea or limbus.
- (2) Outer part of cornea or limbus.
- (3) Lower part of cornea or limbus.
- (4) Inner part of cornea or limbus.
- (5) Sites intermediate to these.
- (6) Front part of cornea.

(1) *Upper site.*

The overhanging position of the eye brow, the tendency for irritable eyes to roll up at the time of operation, the comparative difficulty in the delivery of lens against gravity, the entrance of blood, if any, into the anterior chamber, the comparatively higher astig-

In cases of corneal opacity the cataractous lens should be extracted where the optical iridectomy is done and in such cases these considerations can be neglected.

matism, the increased liability to striped keratitis and formation of a cyclitic membrane in the pupillary region, the occasional occurrence of a filtering cicatrix, the deformity resulting in corneal curvature from displacement of the corneal flap, the practical certainty of the eye being ruined if it suppurates, the action of gravity in spreading infection in irido cyclitis, the movements of the lids in the vertical direction, the tendency for the conjunctival and corneal flap to slip on account of gravity and the action of the lids, the comparatively heavier massage from the orbicularis on the wounded part of the eye ball (especially when an irritable eye rolls up), are disadvantages to be reckoned on.

The help given by gravity in rendering prolapse of the iris and escape of vitreous more difficult appears to be the only advantage in its favor. We have shown that prolapse of the iris and escape of vitreous does not occur with large incisions (two-thirds or three-quarters of the circumference at the limbus).

If for reasons, like corneal opacity, etc., the lens has to be extracted upwards the method described in the April number of the *Indian Medical Gazette* should be adopted. We have since slightly increased the length of incision. This increases the danger of the cornea slipping down. To prevent this it may be necessary to stitch the conjunctival flap, which should not be too freely undermined on either side. The pockets may be made deep without separating the conjunctiva much at the sides. If the surgeon decides to stitch the flap he should pass the thread through the margins of the cut conjunctiva and tie a loose knot some distance away before opening the eye ball. This thread will not obstruct the delivery of the lens and the flap will permit traction and gaping of the wound, as the knot is at a distance and the thread lies on one side. After completion of the operation the loose knot may be tightened. It is better to use fine catgut for the purpose, because it will not be necessary to remove it, and its action is only required until the flap becomes adherent. The cornea may slip down in spite of the stitch, owing to the action of the upper lid. The upper and lower lids and eye brow can be kept under control by stitching the outer canthus and the orbicularis to the temple. We have found this stitch extremely useful and we use it practically in every case, whatever may be the site of incision. Five minutes before operation a subcutaneous injection of a few drops of local anaesthetic is given near the outer canthus and at the temple. A needle with a thick cotton thread is passed through the conjunctiva and brought out one-quarter inch external to the outer canthus. The needle is then

passed through the skin at the temple and brought out again. The two ends of the thread are then tied together by a loose knot and the operation proceeded with. After operation the knot is tightened and secured. This fixes the orbicularis to the temple. The skin cannot move and it becomes impossible for the patient to blink or to open the eye, making the function of dressings still less important.

This stitch does not cause much pain to the patient if the outer canthus is not pulled hard towards the temple. We operate with focal light generally in the evening or at night, and next morning remove the stitch and bandage permanently. When the eye is opened a large quantity of tears mixed with iodoform escapes. The cornea is found to have lustre, is transparent and in good position. The accumulation of tears caused by the stitch does not cause infection, as the fluid cannot enter the eye ball in a conjunctival flap operation as described by us. On the other hand, we think that it prevents friction between the lids and wound. This is important with a large incision on account of the danger of trophic changes in the cornea. Large incisions mean greater nutritional disturbance of the cornea, and friction between the lid and cornea may cause ulceration of the latter. If the surgeon objects to the accumulation of tears he can fill the upper fornix with zinc and iodoform ointment after the completion of the operation before the speculum is removed. The ointment should be of a thin consistency and kept ready filled in a syringe. It is difficult to apply it with the finger, but it can be easily pressed in to the upper fornix with a syringe. This ointment is preferable to yellow ointment because it adheres better and is non-irritating. Prolonged pressure on the *cornea* with a hook at the time of lens extraction is not advisable. The lens can be more easily removed by picking it out with capsular forceps, the iris remaining intact or expressed by pressure from a hook on the *sclerotic* near its junction with the cornea. This avoids the danger of a corneal ulcer forming.

Stitching the eye brow to the forehead is not so useful as the side stitch. The surgeon will appreciate the utility of the stitch at the outer canthus in immobilising lids and eye brow if he places his thumb on the skin near the outer canthus and presses it backwards so as to draw the canthus outwards. He will find that the lids will close in spite of every effort to keep them open, and that he will be absolutely incapable of moving either of his lids or of exercising pressure on the eye ball from the orbital portion of the orbicularis. We hope to discontinue the use of the bandage altogether with the

help of this stitch, using instead a pad of cotton wool and a wire lattice retained by an elastic band. It is possible that the stitch may also remedy the defects of small incisions.

The lids are natural moulds of the front of the eye ball and give uniform support to it without exercising undue pressure, and so form the ideal dressing. If the surgeon wishes to drain away the tears collecting after operation, a small flat piece of gauze may be left between the lids at the outer canthus.

If this stitch is not applied it may occur that the corneal flap becomes displaced in spite of the conjunctival stitch. This displacement is generally temporary, as the cornea regains its curvature when the eye ball regains its tension, but this means some delay in the patient's seeing after operation. It also increases the liability to opacity of Descemet's membrane (striped keratitis), and perhaps a cyclitic membrane in the pupillary region may form from massage of the wounded eye ball by the action of the orbicularis. We are of the opinion that after cataract operation the ciliary processes become congested, especially those contiguous to the wound. Those at the sides are least, and those most distant from the wound are only slightly injured by pressure from the hook. When the conjunctiva regains sensation and reactionary catarrh set in, the patient unconsciously squeezes the eye lid to drive out the tears. This massage of the eye ball presses out turbid aqueous from the ciliary processes into the anterior chamber, causing striped keratitis or a cyclitic membrane. It also makes the eye irritable and painful and causes increased lachrimation. The injured eye requires rest and fixation of the orbicularis at the canthus with a large incision in the eye ball fulfills this purpose. If the turbid aqueous is not squeezed out of the ciliary processes they become full and distended and compensatory circulation at the circum corneal zone is established to drain away the excess of fluid, and the conjunctiva becomes red. It is common to find striped keratitis absent in cases whose conjunctiva is found to be red and oedematous on removal of the dressings.

The orbicularis remains weak for some time after the removal of the stitch. This gives the after-treatment a good start.

(2) *Lower site.*

We have already described downward extraction and discussed its advantages and disadvantages in comparison with upward extraction in the June number of the Indian Medical Gazette.

A few points require further mention.

The collection of tears in the neighborhood of the wound, the

comparatively greater liability to prolapse of the iris, the interference with the flap from movements of the lids or eye ball after the operation, and the pressure from the action of the orbicularis and cheek muscles are disadvantages. In upward extraction, in the usual position of the eye, gravity tends to draw the conjunctival flap down when the patient is lying with the head raised, sitting, standing, or looking down. In downward extraction it helps to keep the flap in position when the patient is lying, but tends to move it more or less forwards when he sits, stands or looks downwards. On the whole, gravity acts favorably. A large conjunctival flap is more liable to be displaced than a small one. The limits to which gravity can cause displacement of the flap are much narrower in downward than in upward extraction. In blinking the lower lid is practically stationary, but in forcible closure of the eye it moves upwards and the orbicularis helped by the cheek muscles causes pressure on the eye ball. This is less under the lower than the upper lid, but greater than that exerted at the inner canthus.

The position of the surgeon and his assistant are the same as in upward extraction, and a speculum is used throughout the operation.

The disadvantages can be got over by making conjunctival check ligaments, or by stitching the conjunctival wound as described. A stitch, however, in the outer canthus fixing the lids and the orbicularis to the temple acts much better than any of these measures in retaining the conjunctival and corneal flap in position. The flow of tears on to the wound during operation can be prevented by placing a piece of gauze one inch long in the upper fornix at the outer side above the upper blade of the speculum. The inner end of the gauze passes between the upper blade and the lid. The speculum can be designed so as to grasp the gauze with either of its blades and hold it in position. Downward extraction can in this way be successfully performed with good results.

(3) *Outer site.*

The disadvantages of this site are that tears flow down over the wound and enter the eye ball at the time of operation, that the pressure from the orbicularis here is greater than at the inner side exposing the injured part of the eye ball to more massage after the operation. It is certainly better in this respect than the upper site. The advantages are that the eye ball is better exposed here than elsewhere on account of the low level of the bony margin of the orbit and the absence of covering from the lids when the eyes are open, the rolling up of the eye by the patient does not cause

much trouble, gravity on the whole acts favorably, striped keratitis is less than in upward extraction, the movements of the lids do not interfere during after treatment, astigmatism ought to be less as the incision may tend to decrease the curvature of the cornea in its horizontal axis. We have already shown that after the disappearance of the lens diaphragm without incision (lens couching) the curvature of the cornea in the horizontal axis is found to be greater than in the vertical. We have not yet been able to collect a sufficient number of patients on whom retinoscopy was performed after outward extraction to confirm the above.

In upward and down extraction the speculum was kept in position throughout the operation, but in outward extraction an ordinary speculum cannot be used as the surgeon stands on the outer side of the eye being operated on.

The use of hooks to elevate the upper lid is open to objections.

The objects of raising the eye brow and lids are:

1. To expose the field of operation.
2. To cause negative pressure in the eye at the time of extraction.
3. To prevent the patient from squeezing the eye ball.
4. To afford space for tears to collect in the lower fornix at the time of operation. This is especially required in inward extraction when no gauze is placed in the upper fornix.

1. A single hook or a double hook with the two blades close to each other does not expose the field of operation so well as when a speculum is used, owing to the lids on either side sloping down from the hook to the orbital margin and covering the eye ball. Moving the hook from side to side so as to expose the part where the surgeon is working is a partial and unsatisfactory remedy. The hook especially exposes the fornix just above it better, but this it does at the expense of the width of the palpebral fissure and the fornix on either side. A surgeon making a corneal incision can use it, but a conjunctival flap operation as described by us requires a wider exposure of the circum-corneal area.

The hooks act best when they fully stretch the upper lid. To elect this they require to be held in a forward and downward direction, but by drawing the lid downwards the field of operation is covered and it becomes difficult for the surgeon to see. The hands of the surgeon and assistant are crowded together in line obstructing manipulations. The surgeon, therefore, pushes the hand of the assistant upwards and does not allow it to remain in a downward position. This relaxes the skin in the infra-orbital region. The

difficulty is specially marked in upward extraction when the surgeon is standing above the head of the patient and is leaning over to see the field of operation. A speculum can be raised from the side and the hand of the assistant is out of the way. His other hand lies flat on the forehead.

The hook passes in front and below the lid margin, its thickness encroaching on the palpebral fissure, but the hooks of the speculum and the transverse piece connecting them remain hidden beneath the lid. The hooks of the speculum are visible at the lid margins at the sides only, and not in the center. The speculum, owing to its having a spring, automatically opens up the palpebral fissure while the hook retractor does not.

2. We have shown that in Smith's technique negative pressure in the eye ball is caused by the pull on the front part of the eye ball exerted through the loose tissue connecting it with the lids and eye brow. The lids must, therefore, be fully stretched to enable them to exert such a pull.

The upper lid can be rendered taut by—

- (1) Lifting it forwards.
- (2) By stretching it in a vertical direction between the eye brow and its free margin.
- (3) By stretching it from side to side.

The skin in the infra-orbital region is looser and therefore more capable of being stretched than near the free margin of the lid. The lid margin is cartilaginous and inextensible. The hook acts chiefly on the lid margin, and if it is drawn forwards only it will not cause the wrinkles in the looser parts of the lid to disappear. The raising of the eye brow stretches the lid to a certain extent only in the vertical direction. We have shown before that the eye brow is raised better by the method advised by us than by Smith's method. That the raising of the eye brow by the latter method does not fully stretch the upper lid in the vertical direction when the hook is lifted forwards *only* can be seen by the possibility of drawing the lid margin further down. This, however, means an encroachment on the field of operation. A speculum stretches the lid from *side to side*, but a single hook does not, and a double hook with the blades close to each other does so to a less degree than a speculum. The chief action of the speculum is not on the lid margin. The bar connecting the two hooks supports a broader surface of the upper lid, raising the looser parts of the lids also when lifted forwards.

3. When the eye brow is managed by the method advised by us it is impossible for the patient to squeeze the eye ball.

1. The speculum retracts the lower lid and opens up the inferior fornix automatically without the help of assistant.

A hook can be pulled forwards very forcibly and the harder it is pulled the less liable will it be to slip. A forcible pull will have the effect of moving the cartilaginous margin of the palpebral fissure bodily forwards by stretching the connections of the lid, drawing on the front of the eye ball and causing negative pressure. The force required to secure this is such as to cause pain. The speculum cannot be lifted forwards with sufficient force without coming out. Taking into consideration the principles on which the causation of negative pressure in the eye is based, we are of opinion that *indirect* traction on the eye ball through its attachments is objectionable. Although the hook is better than the speculum for the production of negative pressure, simpler and more effective methods are available. The eye ball can be easily lifted out of its bed by direct traction on the conjunctival flap or when a forward corneal incision is made by grasping the ocular conjunctiva with fixation or tenaculum forceps and pulling it forwards. This will relieve pressure on the posterior compartment and increase the containing capacity of the eye ball. The proper function of a lid retractor is to expose the field of operation.

Comparatively greater care is required in the removal of the speculum after operation, but this is not difficult if the surgeon takes over charge of the speculum himself, and lifts it forward before removing it. This makes one hand of the assistant free, who either grasps the thread at the outer canthus or puts his thumb on the skin near the orbital margin ready to close the lids by drawing backwards when the speculum is removed. The thumb is kept in place until the outer canthus is fixed on to the temple.

The hook has the advantage of being more easily removable after operation, but for this reason is also more reliable to slip from its proper position at the time of operation.

In the absence of a speculum that can be raised from the inner side of the eye, we recommend the use of a double hook in outward extraction. The eye lid retractor of Noyes serves the purpose: the wire loops can be set at the desired angle and a piece of gauze placed between them to retain the tears. A hook such as De Wecker's strabismus hook also answers the purpose. In this there are two blades, one of which is a sliding one. The piece of gauze can be held between the blades. It has the objection of being a single hook. A hook similar to T shaped artery forceps, but with only one side of the T of proper length, and set at a proper angle to

the handle can be used. The piece of gauze can be grasped in the teeth of the forceps. Fisher's hook also serves the purpose, but we do not prefer it to a speculum. In this respect we disagree with Dr. Fisher of Chicago.

With one of these hooks the assistant raises the upper lid and eye brow with one hand, and with the thumb of the other he pulls the lower lid down when standing on the other side of the eye being operated on. If he likes to stand above the head of the patient he can retract the lids in the same way, with the difference that the palmar side of his fingers will manage the eye brow; or he can raise the eye brow with the tips of the fingers or thumb of one hand and hold the hook with the other. The lower fornix and lids can be retracted by a tenaculum forceps or a stitch. The tenaculum forceps grasping the conjunctiva will remain in position by themselves and keep the lower lid retracted. The lower lid does not require so much care as the upper one. The advantage in retracting the lower lid by the thumb is that if it does not slip the exposure is better. A piece of cotton wool may be placed under the thumb if there be such a tendency or Tincture Benzoin Co. applied. The advantage of tenaculum forceps is that they can be used to cause negative pressure in the eye ball as already described. The best position for the surgeon and his assistants is that in which both can see what is being done so that measures can be promptly taken in cases of emergency or accident. The position of the assistant above the patient's head is not an ideal one, as the leaning over of the assistant to watch the operation has objections. In outward extraction the surgeon should stand on the side of the eye being operated on and the assistant on the opposite side.

(4) *Inner site.*

The disadvantages of this site are that the nose offers obstruction to manipulation, that it is surgically the dirtiest corner of the eye on account of the proximity of the nasal and lachrymal ducts, the caruncle and collection of matter washed down by the tears. The conjunctiva here is thicker, less elastic and more fixed than at the other sites. Owing to the shallowness of the fornices, the conjunctival flap lies flat when dissected. When lifted it shows a conjunctival band running across it from above downwards. This is more pronounced in the eyes of agriculturists in India whose conjunctiva has become thickened from irritation from dust, etc., than in the eyes of those who live in better conditions and in large cities. This band does not allow the wound to gape well nor does traction on it cause sufficient negative pressure in the eye ball. These difficul-

ties can be overcome by snipping into the conjunctival band beyond the limit of the flap. If this does not make the flap fairly loose the sides of the flap may be snipped. The inner corner of the eye is least exposed to massage by the orbicularis. The muscle is fixed here and the skin on the nose is much less free to move than that at the outer canthus. Blinking movements also cause least disturbance to the flap. Ordinarily in blinking the upper and lower lids only meet at their outer three-fourths, and do not come in opposition at their inner one-fourth unless forcible contraction is made.

Less astigmatism is to be expected for the reason given in outward extraction.

In inward extraction the surgeon should stand on the opposite side to the eye that is being operated on; the assistant can stand either above the head or on the side opposite to the surgeon. In the former position he can use his right hand to lift up the speculum in the manner described in one of our previous papers, or by grasping the upper blade with the thumb and index finger and resting the lower blade on the middle finger, which is passed between the blades and rests on the cheek of the patient. In this way the blades are kept apart, and the speculum can be lifted forwards at the same time. With the left hand he can manage the eye brow. If the assistant stands on the side he should lift up the speculum with the right hand and raise the eye brow with the thumb of the left hand as described. It is better for him to stand on the side, as his hands are farther removed from those of the surgeon. In addition he will have the great advantage of being able to see the operation easily. The hand on the eye brow should lie flat, so as to encroach less on the surgeon's space.

The obstruction from the nose is overcome by tilting the patient's head a little towards the sound eye and by using scissors suitably curved on the flat or angularly bent for enlarging the wound. At all sites the first puncture in the eye ball should be made in the center and the incision enlarged with scissors on either side, except when the lens is extracted downwards. In the latter case the first puncture should be made at the outer side in the right eye, and the inner in the left eye. The incision should then be enlarged with scissors in the proper direction. The inner canthus can be touched with a little Tincture of Iodine as an extra measure to sterilize it. The flow of tears during operation can be dealt with by holding a small piece of gauze in the speculum as described above, either in the upper or lower fornix, though it is not necessary in inward

extraction, as the lower fornix below the inner canthus and wound affords ample space for the collection of tears without permitting them to enter the eye ball.

(5) *The four intermediate positions.*

The advantages and disadvantages of these sites can be easily understood on the principles defined above. The incision in the eye ball in these positions will disengage the antagonistic set of muscles even when the incision is little more than quarter of the circumference of the cornea. But this length of incision is not very satisfactory. If the cornea is not cut to a fair distance beyond the line of action of the antagonistic muscles a fair amount of force can still be transmitted through the corneo scleral junction even though the continuity of the cornea in the line of action of the muscle is broken. Besides, the two adjacent recti working on the corneal flap will pull the cornea in one direction and the other two pull the cut margin of the sclerotic in the opposite direction, thereby causing gaping and the complications resulting from it such as astigmatism, filtering cicatrix, etc. Oblique astigmatism, which is known to give more inconvenience to the patient than when it is horizontal or vertical, may also be caused. A small incision renders manipulations more difficult, especially when it is desired to pick out the lens with capsular forceps.

Knowing that the massage of the injured part of the eye ball by the orbicularis is a source of great trouble during after-treatment of cataract operations and that it is the cause of several serious complications, such as turbidity of the vitreous, softened eye ball, atrophy of the cornea, atrophy of the vitreous, choroido-retinitis, corneal ulcer, keratitis, corneal opacity, etc., which occasionally result in permanent loss or serious defect of vision and ruin the results of otherwise successful operations, it would appear that the site of election for lens extraction should be the inner one, either directly inwards, upwards and inwards, or downwards and inwards. Massage from the orbicularis causes such serious complications in very rare cases only, but lesser troubles, such as prolonged lachrimation, pain, irritability of the eyes, striped keratitis, cyclitic membrane in the pupillary region, etc., are also important. Outward and downward extraction have also something in their favor. Further experience is needed to enable us to finally decide the site of election for cataract extraction, and we hope to refer again to the subject when we have examined a sufficient number of cases by retinoscopy.

(6) *Front part of cornea.*

This we have already discussed to some extent in our previous papers. We intend to take it up again in the near future, as there are some further points to be mentioned.

III.

How Traction on the Conjunctival Flap Causes Negative Pressure in the Eye Ball.

We have shown in previous papers that after the disappearance of the lens diaphragm in cataract extraction the containing capacity of the posterior compartment of the eye ball diminishes, resulting in forward displacement of the vitreous. Any manipulation tending to cause negative pressure so as to make the vitreous recede must necessarily increase the containing capacity of the posterior compartment of the eye ball. This means restoring it as far as possible to its original shape, as a sphere has the largest cubic space for a unit surface area.

There are several methods of doing this.

Smith employs a very skilful assistant who raises the eye brow with the tips of the fingers and at the same time lifts the upper lid with a strabismus hook held in the same hand. With the other hand the lower lid is drawn down (see *The Treatment of Cataract* by Smith, Figure 25).

When the eye brow is drawn upwards the connections between it and the upper fornix pull on the conjunctival reflection and the sub-conjunctival tissue and through them on the eye ball. This is helped by lifting the lid with a strabismus hook.

The connections between the eye brow and the eye ball are loose, the conjunctiva is extensible and the eye brow can be pushed upwards to a limited extent only. The pull on the eye ball is therefore very limited.

The eye brow is managed by the tips of the fingers. The extensor muscles of these are not strong enough to overcome the action of the occipito frontalis and orbicularis palpebrarum. This can actually be demonstrated, and it will be observed that the hand held as directed by Smith can be moved by the action of the orbital portion of these muscles.

The important duty of controlling the capacity of the eye ball is relegated entirely to the assistant, and it is stated that without a specially trained assistant success in the operation is impossible.

We have shown in one of our previous papers that the capsule of the eye ball is specially liable to be depressed in certain regions. The back part of the capsule in the region of the optic nerve is depressed by the orbital fat whenever the eye ball becomes soft. This

depression is more marked in smaller incisions than in larger ones, as there is less exophthalmos in the former and the eyes are rendered equally soft, unless the incision is extremely small. From our point of view Smith's incision is a small one. The posterior part of the capsule is thus more depressed in Smith's operation, but this method of managing the lids and eye brow does not attempt to reduce this depression. It aims at drawing the segments of the capsule above and below the incision away from each other. Smith therefore attempts to overcome that flattening of the capsule above caused by gravity through the loose connections between the eye brow and the eye ball.

Pressure from the tips of the assistant's fingers on the orbital nerve is liable to cause the patient pain and make him move the eye brow.

In the method recommended by us the assistant places the whole length of the thumb on the upper lid below the eye brow and carries it upwards. The eye brow is not covered by the thumb, but is visible above it, and its prominence prevents the thumb from slipping upwards. The palm of the hand rests either on the temple or on the forehead, depending on the eye that is being operated on. The eye brow has greater motility at its outer part, which should, therefore, receive greater attention. If the thumb be properly placed as advised it is absolutely impossible for the patient to move the eye brow. The upper fornix is pulled on to a greater extent and the eye brow is more under control than in the method recommended by Smith. As the whole length of the thumb is resting on the orbital margin the pressure on the supra orbital nerve will not be so painful as when the tips of the fingers are used. With the other hand the assistant lifts up the speculum. The thumb rests in front on the point where the two blades join and presses backwards, while the index and middle fingers support the blades from below and push them forwards in such a way that the blades remain wide apart. In this way the lids are lifted away from the eye ball.

Smith's speculum may be used, but it should have a strong spring.

This has an advantage over raising the upper lid on a hook in that a greater length of the lid is supported. It has the disadvantage that the lid cannot be lifted so far from the eye ball on account of the greater breadth raised. The lower lid is also drawn away from the eye ball by the lower blade of the speculum, making extra help from the assistant for this purpose unnecessary.

Direct traction on the conjunctival flap is an extra measure not found in Smith's technique.

In the conjunctival flap operation there is loss of continuity in the conjunctiva between the fornix and corneo scleral junction on the side of the flap, and the pull on the capsule of the eye ball from the fornix is exerted only through the loose sub-conjunctival tissue on this side. The making of the conjunctival flap, therefore, weakens the pull from the fornix. The conjunctiva is firmly attached at the corneo scleral junction, and so traction directly on the conjunctival flap is a powerful factor in restoring the posterior compartment of the eye ball to its original shape. This more than compensates for the loss of continuity in the conjunctiva between the fornix and the corneo scleral junction. The surgeon can use as much or as little force as is required by the circumstances. It is not self-limited, as in Smith's technique, where the distance to which the eye brow can be carried on the forehead of the patient governs the strength of the pull, nor is there such a long strip of elastic conjunctiva intervening between the corneo scleral junction and the point where the force is applied.

It is better to use fixation forceps with several teeth so that a greater breadth of flap may be caught.

Traction on the flap in front causes counter traction by the optic nerve on the capsule of the eye ball behind. The flattening there disappears, the eye ball resumes its spherical shape, its cubic capacity increases and the vitreous recedes.

This method of producing negative pressure has the great advantage that it is under the control of the surgeon himself.

Sometimes the vitreous is seen to rise and fall, showing that the external muscles are exerting pressure and alternately depressing the capsule and allowing it to resume its original shape. In such cases the pull on the conjunctival flap is relaxed or increased as the circumstances demand. The surgeon must learn by experience the requisite amount of force that will serve his purpose. If the flap be pulled on with too much force it may make conditions worse by flattening the capsule of the eye ball in the equatorial region, converting its spherical shape into something like an ellipse with its long diameter running antero posteriorly.

The lifting up of the speculum and raising the eye brow are necessary, not only because they make the conjunctiva support the upper part of the capsule against gravity, but in addition they cause the facial expansions and conjunctiva direct the force of the pull on the flap in the proper direction.*

The conjunctival flap should be pulled forwards and downwards

*In upward extraction the weight of the vitreous and capsule of the eye ball is an extra help.

in downward extraction and forwards and upwards in upward extraction. It should not be pulled towards the fornix, as if this is done the superior rectus and inferior oblique will depress the capsule more in downward and the superior oblique and inferior rectus in upward extraction.

IV.

In the April number of the Indian Medical Gazette we described the upward extraction of cataractous lenses. In the June number we described downward extraction, and pointed out that one of the disadvantages of it was that the field of operation was more difficult to keep clean and dry. The risk of infection from conjunctival fluid was therefore greater.

In upward extraction no antiseptic was used to wash the eye before operation, and the results were very good. The eye ball was well flushed with plain sterilized water or normal saline only, *immediately* before operation, as even washing with water earlier was found to cause irritation of the conjunctiva and increased secretion.

To obviate the collection of tears at the site of the wound in downward extraction, special measures require to be used.

A piece of cyanide gauze is placed in the upper fornix to catch the tears and prevent them from reaching the inferior fornix and the wound. The speculum keeps the gauze in position.

A drop of argyrol solution, dr. 1 to oz. 1, is instilled into the eye after flushing it with plain water. When the operation is finished the piece of gauze is removed and the upper and lower fornices are filled with a large quantity of sterilized boro-iodoform while the speculum is still in situ. This powder not only acts as an antiseptic when mixed with tears and mucopurulent discharge from the eye, but also prevents friction between the lid and eye ball, and holds the tears or other secretions until the wound is sealed. Infection cannot enter the eye ball, as there is no collection of free fluid near the wound at the time of operation. It has the further advantages that it prevents the patient from squeezing the eye and expelling the vitreous when the speculum is being removed and keeps the conjunctival flap in position afterwards.

We advise the surgeon to take over charge of the speculum himself when the operation is finished. He must be careful that the blades do not press on the eye ball when removing it.

If these measures be adopted with a very large incision in the eye ball (about two-thirds or three-fourths the circumference at the corneo scleral junction) and a broad preliminary conjunctival

flap made, it is not necessary to put a piece of catgut in the iridic angle to prevent prolapse of iris.

Catgut sometimes takes 15 or 20 days to get absorbed completely. It generally remains in the iridic angle behind the sclerotic and is not visible. But it is sometimes pushed forward by the vitreous and is seen lying behind the cornea in the lower part of the anterior chamber. A thin white line is sometimes seen on the posterior surface of the cornea where the catgut has been touching it. It does not occlude the pupil and gives trouble in no other way.

We discontinued the catgut in about thirty cases operated on by downward extraction. The above measures were adopted and there was not a single case of prolapse of iris, iritis, suppuration, rupture of the lens, or escape of vitreous, although neither iridectomy nor iridotomy was performed. In a few cases a very small piece of iris was accidentally cut and removed. The pupil remained clear, central, circular and active in all cases except those in which the iris was accidentally cut.

We will later on fully publish the result of these measures after the experience of one cold weather, as in this season one can calculate the percentage of results on one or two days' work.

V.

Site of Election for Incision in Cataract Extraction.

Since writing the above paper we have discontinued the use of the bandage altogether in ordinary cases, and instead of stitching the outer canthus to the temple we fix it by a loop which passes around the ear. A piece of rubber tubing threaded on the loop prevents the twine from causing pain. The tension on the ear can also be diminished by fixing the twine to the temple with a piece of adhesive plaster. When the eye is closed we place a thin layer of cotton wool over the lids, eye brow, part of the cheek, forehead and temple and apply collodion.

This immobilizes the lids and eye brow and it becomes impossible for the patient to open the eye or exercise pressure on it. Tears can still trickle out to a certain extent. Collodion is more effective in controlling movements of the eye ball, lids and eye brow than the bandage. The support from it in front is uniform. With ordinary dressings (cotton and bandage) the patient can open the lids underneath but this is not the case with a collodion dressing.

After 12 hours the dressing is cut in the line of the palpebral aperture and left on as long as is considered necessary. The advantage of leaving it on for some time is that it reduces lachrima-

tion and congestion of the conjunctiva besides preventing massage from the orbicularis. When the dressing is cut, the patient can see though the movements of the lids are very limited. Sedatives such as belladonna, opium, menthol, etc., may if necessary be combined with the collodion.

VI.

To the Editor Ophthalmology, Seattle:

Sir: I should be obliged if you will please insert this letter with the following short note on the evolution of intra capsular extraction of cataract to prevent misapprehension on the subject:

1. An *old* method REVIVED by Alexander Pagenstecher and his brother Hermann.

2. Practiced by Higgins of Guy's Hospital as early as 1888.

3. Practiced by Colonel McCloghry, I. M. S., and Dr. Nana-wati at Ahmadabad as early as 1894-5.

4. Practiced by Colonel Maynard, I. M. S., in certain cases years before expression was heard of.

5. Practiced by Colonel Mulroney, I. M. S., Amritsar and probably many others.

6. Revived again by Colonel Smith, I. M. S., *who does not claim to have been its originator*, vide "The Ophthalmoscope," June, 1915, page 273.

7. My claims for my operation are fully stated in the April number of the Indian Medical Gazette.

8. Upward and downward extraction of the lens in capsule by my method have already been described. A note on extracting the lens in capsule outward or inward by my method is being sent for publication.

Yours etc., etc.,

HARI SHANKI, Ass't. Surgeon.

Sept. 15, 1916, Civil Hospital, Delhi.

REMARKS UPON THE TREATMENT AND PROGNOSIS OF CHRONIC GLAUCOMA

A. A. BRADBURN, F. R. C. S.

MANCHESTER, ENGLAND.

The more one studies the histories of one's cases of glaucoma and the longer we observe them the more uncertain becomes the prognosis which it is possible to give with any degree of certainty. We all have met with those cases which have seemingly remained perfectly well, despite the fact that they have seen no one professionally after the initial consultation, or after the original iridectomy. Such, doubtless, are rare, but that they do exist makes us very skeptical in coming to any conclusions as to the proper treatment to adopt or the prognosis to give in any case.

In the histories appended of the foregoing cases there seems to be some points of interest from which certain conclusions can, perhaps, with a limitation, be drawn.

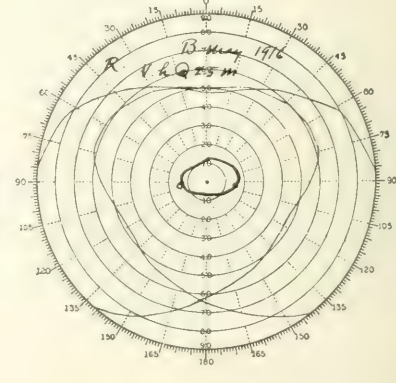
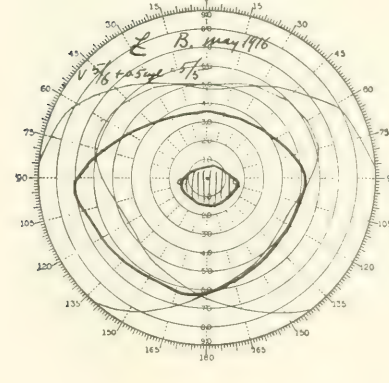
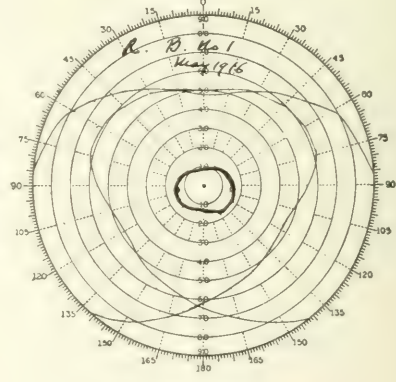
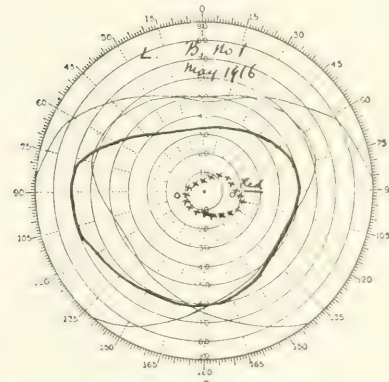
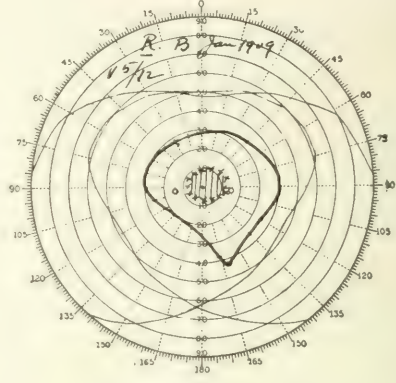
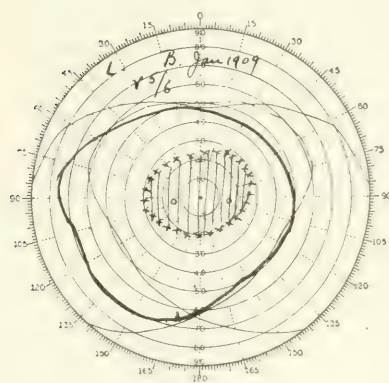
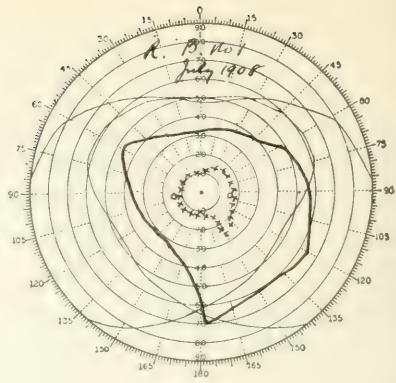
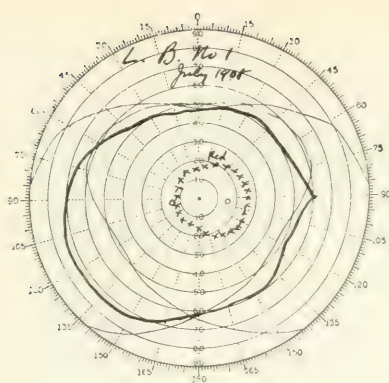
First of all comes the vexed question of operation, and the type best suitable to chronic glaucoma. To open a channel in the eye to relieve an excess of internal pressure is undoubtedly the ultimate aim of all measures adopted in the management of glaucoma. If this can be successfully obtained and *maintained* without resort to the knife it should certainly be strived for, unless we have any fear that an acute attack is likely to supervene under circumstances where relief cannot be instantly obtained. Again, no operation should be performed until the condition has been closely watched for a certain period, for it must not be forgotten that we are dealing with a *symptom* that is but the expression of other trouble which it is our bounden duty to endeavor to discover. We should always bear in mind that in glaucoma we are dealing with a "sick eye" which when first seen is nearly always not in a fit condition to stand the shock of an operation. We should no more rush in at an operation on a glaucomatous eye—even in some acute cases—than we should operate elsewhere on the body in a debilitated subject. For the same reasons, it is my firm belief that no matter what operation is performed, it should be of the gentlest possible, and *the one which causes least reaction to the patient and the eye should in all cases have the preference.*

In the above histories the trephine operation was performed four times, but in only one was it really a success. In one it led to the outbreak of a gouty inflammation, in another it accelerated the optic atrophy which was already advanced; in another it failed to

keep the tension down despite the apparently classical appearance which it subsequently presented; in another it led to infection of the deeper parts. It is true I have had successes with it, but its performance entails more shock to the eye or a strain on the patient owing to it taking some time to carry out, and its results are certainly not always what one cares to encounter. The "old fashioned" broad iridectomy has the merit of rapidity and consequent lessened shock and reaction, but it sadly disfigures the eye, destroys the optical properties of the iris and necessitates a prolonged convalescence during which the excretory channels we have purposely designed become sealed and closed. There is also the added risks of dislocation of the lens, intra-ocular hemorrhage, wounding of lens, etc., which are not impossible complications even in the quietest of patients.

The operation which, in my hands, at least, has given every satisfaction and in which I have yet to meet with a failure, when performed in suitable cases and after due preparation, and carefully estimated consideration of the underlying cause, is a small, basal, button-hole iridectomy of but a couple or three millimeters, *with subsequent massage of the eye within twenty-four hours*. The last is the essential feature, and provided that but the slightest traumatism has been inflicted, can be carried out without pain or reaction. This operation, in that it allows the pupillary border of the iris intact, allows the subsequent employment of miotics, if such should be deemed necessary. As a rule such are not needed, if the principles of auto massage be learnt properly by the patient and faithfully carried out, and the omission of miotics certainly removes a liability to return of tension from the irritating effects of the drops. In four of the above recorded cases the only treatment they now adopt is auto-ocular massage, although they have instructions to revert to miotics should they detect any return of tension; it is very seldom this is done. I have many others carrying out this treatment and with most satisfactory results, but yet, as I have already mentioned, it is impossible to draw a hard and fast conclusion, as we all know of cases doing well without apparently any treatment whatever.

On the other hand, I have met with cases with vision nearly gone which, though probably the result of ensuing optic atrophy, have undoubtedly had a continuance of increased and unrecognized maintenance of increased pressure, which may have been the chief cause—perhaps by its effect on the nutrition—of the optic atrophy.



Had such cases been taught by auto-massage to watch their own case, the result would, in all probability, have been far different.

Case B. No. (1)—Bilateral Chronic Glaucoma.

Operation R. E. gradual deterioration of vision, miotics and massage in left eye; apparent arrest of progress.

Unmarried lady, aged 62; first seen in June, 1908. History of three weeks' discomfort in sight of right eye.

Right Eye—Hypermetropic 0.75. V=5/5. T. slightly plus. A. C. deep. Pupil active. Disc cupped, but not undermined, nerve tissue flattened against sides, cribriform fascia showing, halo around margin.

Left Eye—Hypermetropia +0.5. V=8/5. T. normal. Disc excavated but to less extent than in fellow eye.

Treatment—Miotics and anti-gouty treatment, as the patient was the subject of a mild form of rheumatic gout. After a month's observation under this treatment, during which the tension seemed to increase and the vision decreased, a broad upward iridectomy was performed on the right eye. The wound healed quickly and apparently solidly, and in a few months' time the tension became as hard as ever, so an anterior sclerotomy was performed in the site of the original iridectomy. This was successful in keeping the tension down, but the vision steadily decreased until it reached 5/24 by 1910.

As the tension in the left eye, despite the employment of miotics, showed occasional rises, the question of an operation was submitted to Mr. Glascott of Manchester, and his verdict was that as the original operation had apparently mastered the rise of tension in the right eye, the left eye could be left unoperated upon for some time yet with safety. This opinion was given in 1909, and in 1910 I had instituted daily auto-massage on both eyes. For the last two years now this has been practically the only treatment employed by the patient, and the result today, eight years since she was first seen, is a slight contraction in the upper part of the visual field for white, a 10° degree of peripheral contraction for red with maintenance of full distance vision (5/6 cyl + 0.8D cyl=5/5), and for reading (+4D=Ii) in the unoperated eye. The excavation of the disc in this eye is only equal to -2D, and there is no undermining, so this appearance can be attributed to atrophy from years and not from pressure. In the unoperated eye vision is reduced to counting fingers at 2.5 metres, and this is due to onset of cuticular changes. The visual field is markedly contracted. No view of fundus could be seen through the haze of the lens. In both eyes the tension is

slightly subnormal, and the patient, who by this time is an expert at estimating intra-ocular tension, says that in neither eye has a rise of tension been detected for the past two or three years.

Case C. No. (2)—Glaucoma Simplex.

Trephining of left eye. Author's iridectomy in right eye.

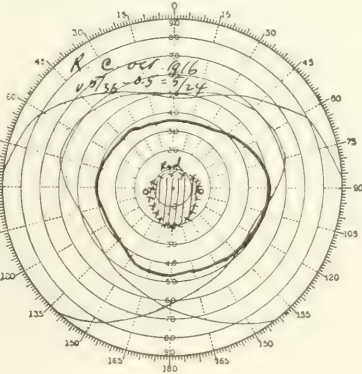
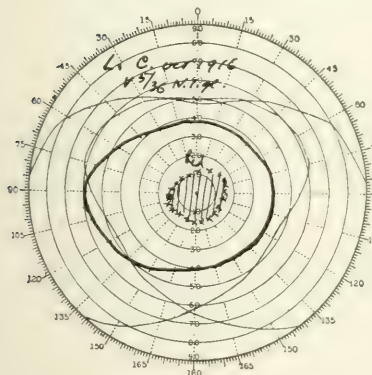
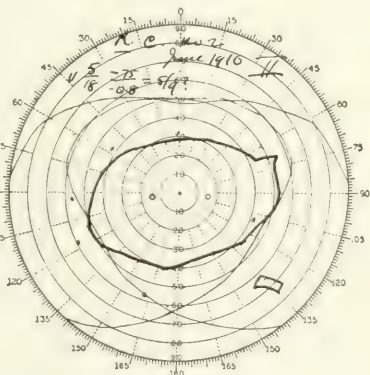
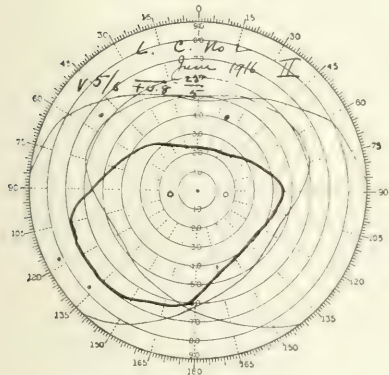
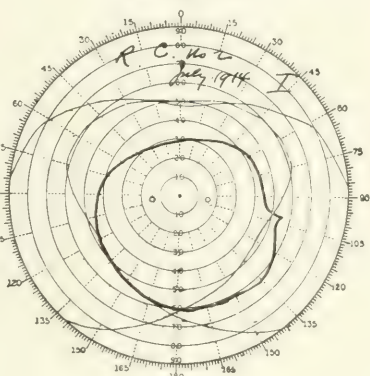
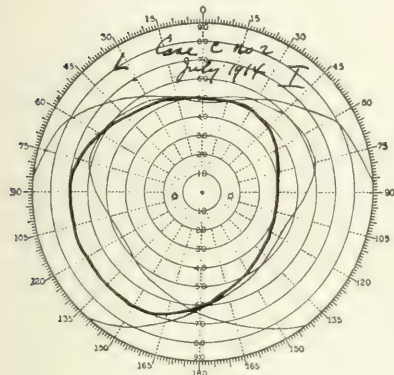
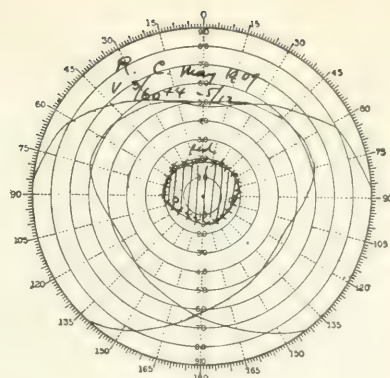
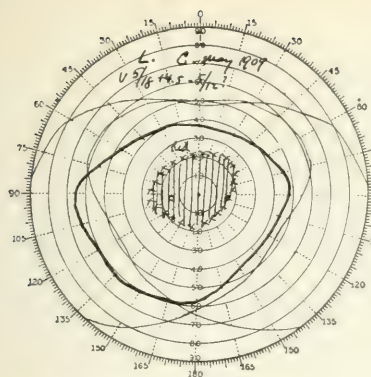
History—Miss B—, aged 32, attended the out-patient department at my hospital September 6, 1913, complaining that her eyes ached after reading. Questioning elicited the statement that a maternal aunt had drowned herself one night in a neighboring canal ten years previously, as the result of an attack of most intense pain in the eyes; she would be at the time of her death about 30 years of age, that is of about the same age as her niece was now.

Patient's mother was examined and found to have good sight, with no trace of glaucoma, but had deeply cupped discs. The father's vision was defective from scars left by small ulcers, the result of his work as a stone mason. Three sisters younger and three brothers older have all apparently normal eyesight. Patient is well developed, but inclined to be "neuralgic" and has for some years suffered from a mild form of catarrhal otitis media on the left side.

Examination revealed a slight degree of hyper-metropic astigmatism in the right eye and simple hyper-metropia in the left. Both discs were slightly cupped with flattened sides, only a narrow ring of nerve head remaining. The ocular tension was normal at the first few visits, but a month later a rise was detected in the right eye, and where this was found pulsation could be seen in the retinal vessels. As a precautionary measure miotics, dionine and auto-massage means were adopted.

I saw her last in June, 1916. Vision in the left eye was $\frac{5}{6}$ and with $+0.5$ D cyl ax. $90=5/5$; that in the right was $\frac{5}{18}$ with minus glasses $\frac{8}{9}$ (?). In both the tension was perfectly normal. The disc measured -2.5 D in depth and its excavation was cone-shaped, exposing only a small area of the cribriform base; outer side very white, nasal portion better colored, no ring of nerve tissues at retinal level. Diameter of cornea 11 mm. The left eye showed 2 mm. peripheral button-hole, leaving one mm. of pupillary border to the iris, pupil was 2.5 mm. in diameter, A. C. shallow, corneal diameter 11. mm. Depth of excavation $-2D$, with sides sloping outwards from center of floor and later formed of cribriform fascia; some nerve tissue present at retinal level at upper part.

The points of interest in this case are the early age of owner of the glaucoma with its insidious onset. The history pointing to an



hereditary tendency and to presence of a discharge from the right ear. Though many attempts were made to obtain a definite relationship between the exacerbations of the ear trouble and the eye affection, it could not be proved, but one cannot help thinking that there was the possibility of an irritative toxin which might have in its passage through the aqueous some irritative action on the excretory channels. The points relative to the operation are discussed later.

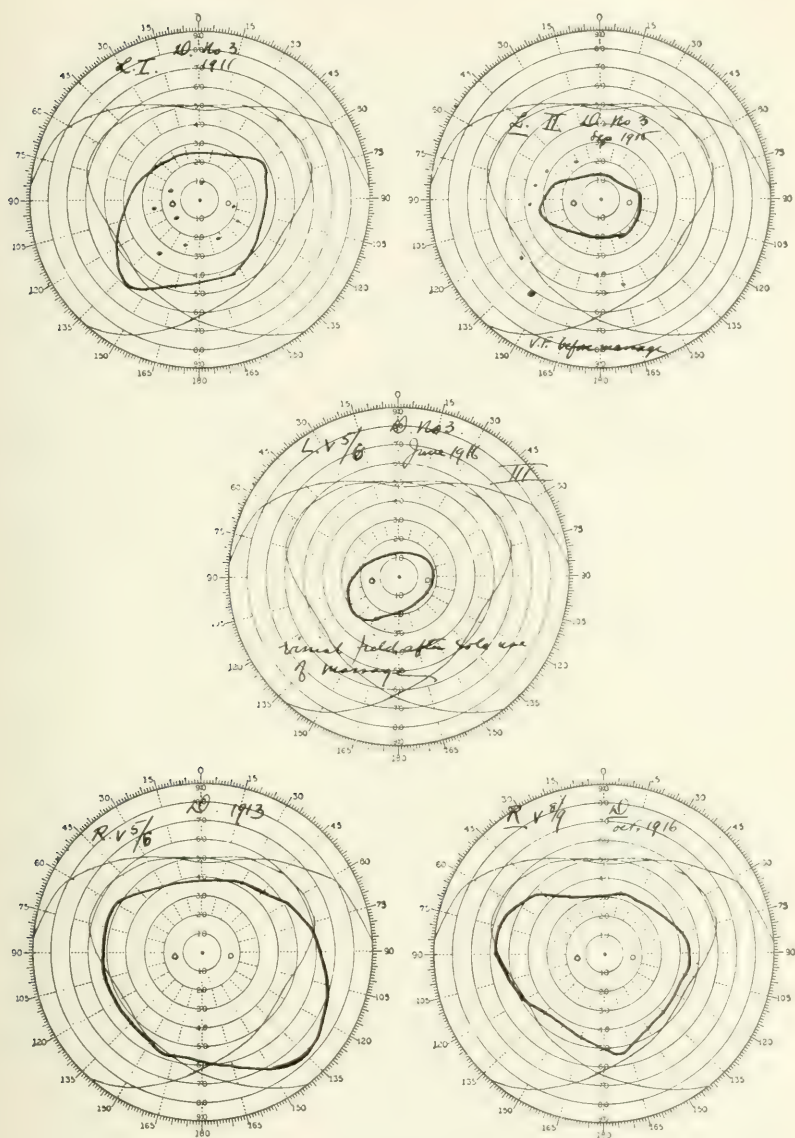
On the 31st of January, that is four months after her first visit, she mentioned for the first time that she had noticed "rings of light around the street lamps," and the tension was found to be raised slightly in both eyes. I therefore decided to submit one eye to operation, and on February 14th successfully trephined the right eye, excising at the same time a piece of the iris. The operation was followed by severe neuralgic pains, but with very little reaction in the eye itself. On March 7th she had a recurrence of pain in the eye, and the tension was found to be raised, but it came down easily with massage, the trephine opening evidently being quite patent.

During the next nine months she attended regularly at the hospital, and the tension varied in both eyes, sometimes palpably up at others quite normal. She reported occasional rises detected **by herself** and also intermittent returns of "halos" and neuralgic pains.

The visual fields were taken at different periods and as these were steadily contracting, although the near and far vision remained normal, and as the reports and findings of rises of tension continued it was decided to operate.

On January 30, 1915, I performed a small basal iridectomy on the left eye, pushing the iris towards the center of the pupil before withdrawing excising a piece of it, leaving the pupillary portion intact. Twenty-four hours later gentle massage was begun and repeated daily. The eye healed without pain or reaction and only once since has any rise of tension been detected. At the same time I performed a sclerotomy on the right eye, bringing the incision almost into the old trephine hole. The eye reacted slightly, being for some days after painful, which delayed the instituting of massage.

Since then the ocular tension has remained practically normal in both eyes, though occasional rises have been reported as having occurred in the right eye, and this eye has suffered from fleeting



attacks of neuralgia. Miotics at bed time only were used for some months but chief reliance has been placed on auto massage.

Case D. No. (3)—Auto Massage. No Operation.

This is the case of a medical practitioner, aged 60, who first consulted me in April, 1912, for epiphora of four months' duration. He was a semi-invalid from a form of nervous dyspepsia which

he considered of gouty origin. He was of an extremely nervous disposition, the mere mention of operation tending to rouse in him a sense of nervous apprehension which precluded any possibility of ever attempting anything.

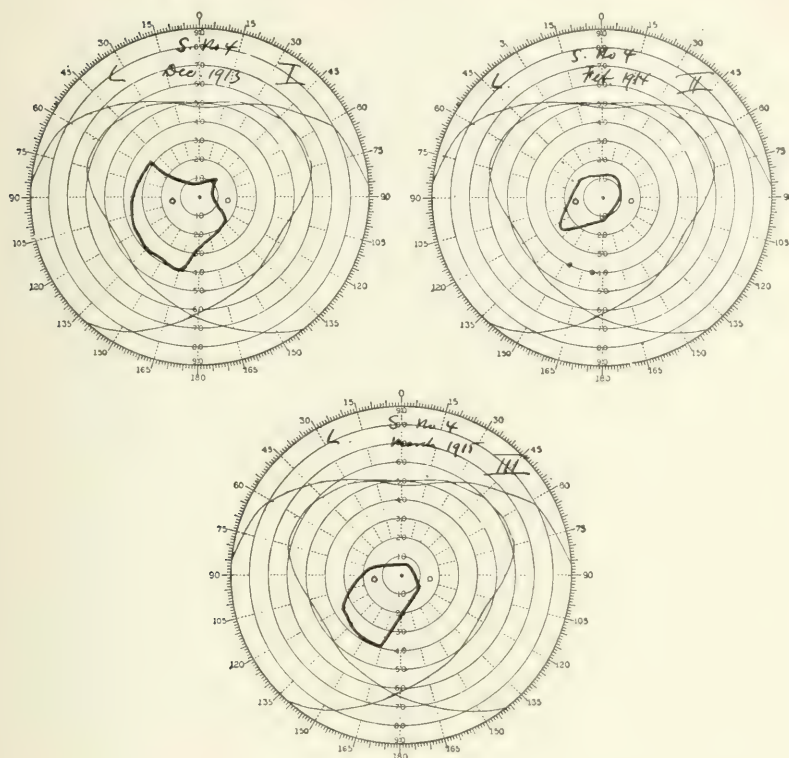
Examination revealed marked plus tension in both eyes, typically glaucomatous cupping and optic atrophy in both eyes. Vision in the right eye was only equal to 5/24, a fact he was quite unaware of until the test was made. The vision in the left eye was 5/6 and with reading lenses he could manage I. 2.

Miotics, dionine and auto massage were instituted and as time passed the ocular tension was kept well in hand until he could dispense with the miotics and dionine except for very occasional use and when last seen in June, 1916, the V=6/6, tension was quite normal, A. C. shallow, pupil 3.5 mm. and active, disc atrophic with broad ring of retinal atrophy, 3 D. deep. Diameter of cornea 11.5 mm. A marked improvement had ensued in the state of the conjunctiva which, owing to the cessation of the use of irritating miotics, had lost all the large dilated vesicles, the ocular portion was clear and white, whilst the palpebral portions had lost their congested, sodden appearance. The only treatment he now employs is ocular massage night and morning.

Case S. No. (4)—Trepining, Subsequent Blockage From Gouty Inflammation Improvement Under Massage.

The patient in this case was a widow of 53 whom I first attended in July, 1913, for failure of vision in the right eye. That of the left had been deficient for years from posterior capsular opacity and it presented the feature of glaucoma. The patient was the subject of a mild form of rheumatic gout, which had specially affected the knee joint of one limb.

Examination of right eye showed a typically cupped glaucomatous disc but with no undermining. Vision = 5/6 + 0.5 D. cyl. ax. 180 = 8/5 and with +2 D. sph. she read I. i. The visual field was very contracted particularly in the upper and nasal aspects. For three months she was treated with miotics and general remedies and at the end of September the tension began to get out of hand so on October 16th I trephined under cocaine without an iridectomy. The following day there was a good deal of oedema of the conjunctiva and slight iritis for which atrophine (8 $\bar{\text{ii}}$ 3¹) were prescribed. The swelling later affected the eye-lids and difficulty was experienced in opening them. There was marked redness of the whole of the conjunctiva and the tension remained up. Iced lotions, atrophine with adrenalin externally, and benzoate of



soda internally were used and in three weeks the symptoms abated although the tension remained high. A slight recurrence took place of the inflammation on November 17th, and when it had passed off massage of the eyeball was begun by her daughter who was a professional masseuse. The onset of this last attack seemed to follow the restarting of miotics and it is probable then irritant action brought on the first attack which the operation lighted up. The vision by December 3rd was 5/18. Tension full, eye quiet. The site of the trephine operation was now occupied by a solid white prohuberance from which not the slightest sign of leakage could be seen. By February 6th the vision had improved to 5/6 and the tension was still hard but came down easily with massage. The visual field was contracted 10° smaller than before the operation.

She has been seen occasionally since and the vision is 5/6 and with glasses I I. The tension is quite normal and has seldom been found up by the patient who has now learnt to massage the eye two or three times a day herself. The media are nearly clear

but not sufficiently so to enable one to measure the depth of the excavated disc. The trephine hole is represented by a solid white patch, almost indistinguishable from the remainder of the sclera, and forms a slightly elevated solid projection to which a fine pencil of vessels run. No evidence of the slightest filtration.

The field of vision shows a slight improvement. The only treatment she now employs is auto massage.

Bilateral Chronic Glaucoma.

Trephining in both eyes, subsequent loss of vision from iritis. Miss E—aged 70, first seen December, 1912. Both eyes hypermetropic 3 D. Vision with glasses equaled 5/6 right eye, and 5/9 partly left eye. Visual field right eye, up 10°, down 48, out 50, in 20, that of left eye limited to a small 5° circle in the center. Tension full in right and higher in left, both discs showed typical glaucomatous cupping. General blood pressure 160 m. m. Miotics, iced pads and ocular massage were ordered during period of observation but only relieved to more pressing symptoms.

An Elliott's operation was carried out on the left eye in February. No iridectomy, wound healed without reaction. The mental strain of this operation accentuated to condition in the right eye, so a week after a similar procedure was carried out in this eye. The tension in both eyes subsequently became quite normal, the vision in the right eye remained 5/6, but that in the left gradually flickered out.

In June, 1914, her medical attendant wrote to say that the patient has had a severe attack of pain in the right eye but she had not sent for anyone till twenty hours after the onset of the attack. Dionine and miotics had been ordered under the impression that the glaucoma had recurred. When I saw her I found the eye intensely congested, cornea hazy, contracted pupil, blocked with exudate, vision only equal to hand movements at one foot, tension minus, patent trephine opening. The whole condition being plainly an injective cyclitis. Under appropriate treatment the symptoms subsided but the adhesions of the iris and the pupillary blockage could not be altered with the result that the vision was only equal to light perception and even this was faulty in the portion of the field down and out.

A METHOD FOR THE LIGATION OF THE OPHTHALMIC VEIN FOR EXOPHTHALMOS WITH REPORT OF A CASE.

DR. FREDERICK KRAUSS,
PHILADELPHIA, PA.

A satisfactory method for the ligation of the ophthalmic vein for the relief of pulsating exophthalmos due to orbital aneurysm or varix, has not been described in any literature at our command.

Good effects have been ascribed to the ligation and excision of some of the orbital veins through incisions in the eyelid. When it is remembered that the orbital fat is filled with enormously dilated veins with free anastomosis, the futility of such procedure is evident.

It occurred to the writer that any deep seated growth on the inner side of the orbit could readily be removed by separating the periosteum from the orbit from above, displacing the contents of the orbit enclosed within the periosteum. An incision in the periosteum at the desired point, would disclose the growth within the orbital fat, from whence it could be removed or a large vessel might be tied, etc. The following operation was used very satisfactorily upon a case of pulsating exophthalmos, having a large pulsating vessel deep in the orbit, behind and to the inner side of the eyeball.

After the usual aseptic preparation of the field (the right eye in this case) the eyebrow being shaved, an incision was made down to the periosteum, beginning at the point of intersection of a vertical line extending from the outer canthus to the upper border of the eyebrow. The incision was carried parallel with, and 5 m. m. above the upper border of the eyebrow to the root of the nose, curving along side of the nose to below the level of the caruncle. Owing to the enormous dilatation of the angular vein there was free bleeding which was caught with artery clamps. The periosteum was carefully separated until the optic nerve could readily be felt with the finger, also demonstrating a large pulsating mass nearby. A vertical slit was made in the periosteum showing the orbital fat to be completely filled with enormously distended veins. A pedicle needle armed with catgut was passed through the incision down, out and backward to enclose the largest mass of pulsating vessels at right angles to its long axis. The catgut was retained double and tied in two sections, making two ligatures with one insertion of the needle. The pulsation ceased. The

wound was closed with through and through silkworm gut sutures, including the periosteum.

In future cases, I intend to apply other ligatures in order to enclose as much of the venous supply as possible to prevent free collateral circulation and a return of the trouble.

We were unfortunate in having a stitchhole abscess which delayed the healing, but the patient made a good recovery, delayed by the necessary draining through gauze packing.

The case history operated upon has been reported in full in the *New York Medical Journal*, issue of May 6, 1916.

A brief resumé is given as follows:

Female—59 years old with a negative family history, presented at first visit an extremely pronounced right-sided exophthalmos, with a loud bruit heard over the face, but loudest over the anterior portion of the temporal bone. There was no ocular pulsation.

The vision was 5/15 of normal in each eye. The eyeground showed great fullness of the retinal veins. The Wasserman reaction was negative. Blood pressure, 215 m. m. systolic. There was no history of traumatism. Treatment consisted of iodides, sodium nitrite, rest in bed with intermittent compression of the common carotid. There was a gradual subsidence for several months after which the patient complained of a sudden, severe pain in the right eye followed by the most intense proptosis of the right eye, and very marked exophthalmos in the left eye. The pulsation in the right eye became very pronounced, but was absent in the left eye. Pressure on the right common carotid caused a disappearance of the bruit and pulsation, though the exophthalmos was unaltered.

The bruit of the temporal bone heard subjectively as a loud continuous blowing noise became less, but was loud over the eye.

The general condition of the patient contraindicated the tying of the common carotid. The movements of the right eye were abolished, except slight movement to the nasal side. The pupil was widely dilated, the chorioidal vessels and veins enormously enlarged, followed shortly by chorioidal and retinal hemorrhages, low grade of iritis with fine vitreous opacities and blindness. After several months of intermittent compressions of the common carotid artery, blindness remained with complete palsy of the external and superior recti. A large pulsating vessel could easily be found on the inner side of the eyeball on deep pressure. An attempt was made to tie this vessel by entering the posterior part of the orbit through the upper inner angle. An incision was made directly above the eyebrow, parallel to the same, from the outer orbital line to the



root of the nose, curving down along the nose to the level of the canthus. The periosteum was separated from the orbit, dislocating the contents of the orbit within its folds. The pulsating vessel being readily felt, an incision was made near it through the periosteum, disclosing enormously distended veins throughout, explaining the exophthalmos. A catgut ligature was passed around the largest and pulsating vessel by means of a pedicle needle and tied. The pulsations ceased.

From further observations, I am convinced that more than one strong ligature should be used if a permanent result is desired, as the collateral circulation enters the dilated veins with a partial return of the symptoms.

The patient made a good recovery, except that a part of the wound showed infections five days later. This yielded to antiseptis. The patient was comfortable through absence of subjective noises.

Several weeks later, pulsations returned in the orbit near the upper, inner edge at which place a small sluggish sinus remained, secreting very little and closing intermittently. The nurses reported saturation of the bandages at intervals with bright red blood, but no one ever saw any bleeding occur. I then made deep massage over the orbit to discover the reason. This caused a tremendous hemorrhage which I immediately controlled by pressure against the bony orbit. Preparations were made to take the patient to the operating room. As the hemorrhage ceased, and there was no further indication of the return of the hemorrhage, the patient was allowed up without any further inference.

During my absence from the city ten days later, there was a spontaneous recurrence of the hemorrhages from the orbit. No one saw any bleeding, although the dressings were saturated daily. The common carotid was tied by Dr. Thomas R. Neilson with resulting subsidence of the pulsating vessels and immediate healing of the small sinus.

Conclusions derived from the study of one case are apt to be erroneous. This case has presented unusual conditions and has been observed for a long time. In a case of pulsating exophthalmos in the service of my colleague, Dr. Ring, and transferred temporarily to me during his absence, ligation of the common carotid caused a temporary cure of exophthalmos with gradual recurrence of the condition.

Anything then that promises additional security is worthy of consideration. Our patient is cured.

The vital points of interest are as follows:

1. Apparent aneurysmal varix between the internal carotid and the cavernous sinus, evidenced by the intense exophthalmos of both eyes, worse in the right, palsy of the internal and external ocular muscles. Pulsation absent from eyeball. Very loud bruit heard all over the face and eye, but most intense over the temporo frontal articulation. Continuous loud noise heard by patient, especially in the right ear.

2. Apparent cure of this condition by rest in bed. Moderate medication and intermittent compressions of the common carotid. This was shown by gradual loss of the subjective noises, bruit no longer heard over the temporal bone, subsidence of the exophthalmos, complete in the left and largely in the right eye, with partial return of ocular movements.

3. A relapse causing more intense exophthalmos than ever in the right eye, moderately in the left. Intense chorioidal engorgement, retinal veins full, later chorioidal hemorrhages, vitreous hemorrhages, low grade of iritis with dilated pupil (palsy) absolute blindness. The blood pressure continued high. Surgical consultants rejected tying of the common carotid as too dangerous in view of the condition of the patient.

4. Ligation of the ophthalmic vein by a new route, namely: Supraorbital and retrobulbar—was successfully performed with partial cure of the condition.

5. Recurrence of collateral circulation in the dilated veins of the orbit caused a pulsation in a new area. The weak walls of the veins no longer retained by the dense periosteum gave way at times, allowing a free gush of blood through a small sinus in the upper inner angle of the orbit.

6. Frequent bleedings caused a fall of the blood pressure to normal. The common carotid was tied without any further complications. Gradual subsidence of the exophthalmos followed. The patient's general health has been greatly benefitted by her prolonged treatment and stay in the hospital. When she was discharged the condition was as follows:

The right eye showed ectropion of the lower lid. The eyeball is in practically normal position with good muscle movement. The cornea is faintly nebulous below. The pupil is widely dilated and immobile. There is a fine haze of the vitreous, preventing a view of the fundus. The left eyeball is normal, except that the nerve shows slight atrophy.

7. The exophthalmos was found to be due to the enormous engorgement of veins in the orbital fat.

I am inclined to think that tying of the ophthalmic vein is in itself insufficient in a severe type of aneurysm of the orbit, on account of the return of collateral circulation. I believe that if the angiomatic mass was tied off in various directions with heavy ligatures, a permanent success would follow. One ligature is insufficient for a permanent cure.

8. The scar resulting from the operation is perceptible only upon close observation, being hidden above the eyebrow and on a line with the curve of the nose.

Postscript.—Six months have elapsed since writing the above. The patient operated has made a complete recovery. Her general health is excellent and the scar resulting from the operation is scarcely perceptible.

NOTES ON THE PRACTICE OF OPHTHALMOLOGY IN WASHINGTON, D. C.

DR. JUAN SANTOS-FERNANDEZ,
HAVANA, CUBA.

Having attended the Second Scientific Pan-American Congress held at Washington, as delegate of the Havana Academy of Sciences, we shall not describe the same, as we have already done so in one of the leading papers of this city, as well as in the reglamentary message to the Academy (1), and we limit ourselves to describe what we have seen in the great capital concerning the branch of medicine in which we have specialized, that is, Ophthalmology. We had written to several of our brother specialists of that city before going there, letting them know about our projected trip to their beautiful and quiet city, and on our arrival at the New Willard Hotel we found the cards of our friends awaiting for us.

Dr. Wilmer invited us to see an operation for cataract at the Episcopal Hospital for Eye, Ear and Throat, which we shall presently describe. Dr. W. K. Butler also invited us to attend his clinic, where he showed us numerous cases of great interest. Dr. Butler asked us the same question that had been put to us by Dr. Arnold Knapp of New York: "Are we justified in operating on one eye with cataract, while the other eye has been already operated upon and has perfect vision?" We answered negatively, because even if the operation for cataract is more perfect every day, we can never assure complete immunity against sympathetic ophthalmia, which may produce loss of both eyes. We well know that the patient may insist upon the second operation, and we then are obliged to do so, but in this case the responsibility is shifted to the patient.

Dr. Stephen O. Richey very kindly let us know that, being sick, it was impossible for him to see us personally, and he sent us his card to introduce us to the Metropolitan Club of Washington.

Drs. W. V. Marmon and L. S. Greene wre also very kind to us, and Dr. W. H. Fox invited us to visit the magnificent Episcopal Hospital, five stories high, dedicated to the work on eye, ear, nose and throat. The Board of Corporators is composed of nearly one hundred members, twenty of which are medical men, fourteen clergymen, twenty married ladies, twelve young unmarried ladies, and the rest is composed of prominent men of various professions and trades. The Executive Committee is composed of the Bishop of Washington, of the First Vice-President, Rev. Charles Buck, and

its executive officer is Dr. William H. Fox, who was very kind to us in every detail and to whom we want to send in this paper our most heartfelt thanks. Ten more members belong to the Executive Committee; half of them are notable medical men, and of whom we have read many papers, especially one entitled "Arterio Sclerosis in Relation to Ocular Lesions."

The work done in the Episcopal Hospital is very great; in the last year 5,306 patients were received and 2,099 operations made; 13,768 consultations were given, of which 8,331 did pay and 8,260 did not pay.

The religious denominations of those patients were as follows: Baptists, 1,233; Episcopalians, 965; Catholics, 963; Methodists, 900; religion not mentioned, 434; Presbyterians or Anglicans, 323; Hebrews, 216; Lutherans, 89; Christians, 88; Congregationalists, 46; Greek Catholics, 20; Adventists, 15; Reformed, 7; Friends, 6; Christian Scientists, 4; United Brethren, 4; Universalists, 3; Unitarians, 3; Salvation Army, 2; Christian Endeavor, 1; Swedenborgian, 1; Reformed German, 1; Theosophists, 1; Zion Union, 1. Total, 5,306.

The number of patients according to the different affections is as follows:

Diseases of the Lids and Lacrymal Apparatus.

183 white and 374 black. Of the first, 94 men and 89 women; of the second, 72 men and 92 women. The figures are very near those of Cuba.

Diseases of the Conjunctiva.

118 white men and 232 white women: 380.

123 black men and 232 black women: 355.

No cases of trachoma have been recorded, and this is purely accidental, because since 1896 Dr. Swan M. Burnett studied that disease there (23), there were seven cases of gonorrheal conjunctivitis.

Diseases of the Cornea

124 whites, 80 men and 44 women; and 209 blacks, 100 men and 109 women.

Interstitial queratitis seems to predominate among whites.

Diseases of the Iris, Ciliary Body and Chorioides.

51 white men and 70 women; and 49 black men and 54 black women. Glaucoma reaches a high cipher: 52 cases in 224 patients. More frequent in white people, that had 37, against 16 cases in the blacks.

Diseases of the Lens and Vitreous Body.

170 whites and 92 blacks. Cataract appeared in 167 whites, and 91 in the blacks.

Diseases of the Optic Nerve and Retina.

Few cases; only 70, and of little importance. Only one case of toxic amblyopia among those produced by alcohol and tobacco.

Diseases of the Globe of the Eye and Orbit.

Only 37, and 5 of wounds. This is easily explained, as Washington is not an industrial city.

Diseases of the Muscles and Nerves.

Nothing particular in the 105 cases of diseases of the nerves and muscles and nerves. Only two cases of paralysis of the seventh pair have been seen, the number being much smaller than in the paralysis of the motor muscles.

Of the 920 cases of refraction we want to say that the number is large compared with the total of 5,306 patients, but it also denotes that there is a notable advancement in the treatment of those errors that not so very long were not treated.

Our belief that the existence of cases of trachoma is slight is confirmed by the reading of the list of operations, in which one can see two cases operated by the brossage of the conjunctiva for trachoma.

Even if trachoma could be extinguished with hygiene, as Swan M. Burnett held, its labor is very slow and the results very delayed, and even the negro to whom we have given a relative immunity, suffers from it in the warm countries where life is on the open (3).

The extirpation of the lachrymal sac is often done, as well as the trepanation of the sclero-corneal junction, of which our paper has described its method as employed by Dr. Wilmer; Lagrange's operation has also been done.

In the operation for cataract we saw that the combined extraction was made more frequently than the simple method, and this confirms our work read before the Scientific Congress (5).

In the departments of ear, nose and throat there is the same activity and everything tends to show that the Episcopal Hospital of Washington, like the historic Wills Eye Hospital of Philadelphia, is a center of medical activities and of progress (6).

Before leaving the City of Washington we paid our respects in the way that was possible to us to the Drs. Dabney, Carl, Kimball, Lamb, Moore, Muncaster, Richardson, Shute, Wells and Dewey, members of the American Academy of Ophthalmology and Oto-

Laryngology, by which they have been honored with the title of Honorary Fellow since 1909.

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TUBERCULOSIS OF THE RETINAL VESSELS*

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Tuberculosis of the eye is as protean in its manifestations, as in the other organs of the body. For instance, this disease may affect the lids, conjunctiva, cornea, sclera, iris, ciliary body, chorioid, retina and perhaps even the lens. If inflammation of the lens existed or were possible, the lens would doubtless respond in this way to the toxins produced by the tubercle bacilli. In fact, lenticular opacities may be, and very likely are, due to autogenous or bacterial toxins circulating in the blood and lymph. Until this is better understood, we may not successfully prevent these opacities or cure them after they have formed. However, it is the object of this paper to deal solely with tuberculosis of the retina and retinal vessels.

The earliest intimation I can find in the literature that hemorrhage from the retinal vessels may be due to tuberculosis is in an article by Noll¹ in 1908. He states that hemorrhages into the vitreous may be due to tuberculosis of the chorioid and ciliary body. Arnold Knapp² is second in an article, entitled "Form of Retinal Tuberculosis." In speaking of the juvenile vascular disease and exudative retinitis, he intimates that tuberculous disease of the retina is the underlying cause. He reported two cases with distinctly retinal lesions, vitreous haze and superficial disturbance of the chorioid. The tuberculin test gave general and local reactions, but he doesn't say whether or not there was a focal reaction. Under treatment with tuberculin, the lesions at first extended, then gradually disappeared, but left serious impairment of central vision.

Agricola and Thies³ examined an eye, which had suffered from serious tuberculous keratitis and iritis, which had healed under tuberculin treatment, but left the eye blind. Later cerebral symptoms arose and the eye was enucleated. There was chronic tuberculosis of the ciliary body, with but slight involvement of the chorioid, and the retina seemed to have become infected through the vitreous. Tissue like that of retinitis proliferans was found near the disc. There were tubercles in the retina, chiefly perivascular.

In this particular case it seems quite evident that the retinal disease was secondary to that of the cornea and iris, so the report of Agricola and Thies need not necessarily be included in my paper.

*Read before the Amer. Acad. of Ophthal. and Oto-Laryngology, Memphis, Tenn., Dec. 11, 12 and 13, 1916.

On the other hand, the severe and extensive involvement of the cornea and iris doubtless prevented early ophthalmoscopic examinations, so that, even had the retinal lesions been primary, these couldn't have been diagnosed prior to the enucleation.

While we probably shouldn't regard all cases of juvenile vascular disease or periphlebitis as tuberculous in character, the tubercle bacillus is responsible for the majority of the cases. Stock⁶ has reported on the anatomic examination of one eye of a patient dying from military tuberculosis. He had suffered obscure symptoms before admission to the hospital. Eight days after admission, there were retinal hemorrhages in both eyes, which were ascribed to general sepsis. On the day of his death, three miliary tubercles were found in the left chorioid. The histologic examination showed hemorrhages in the nerve fiber and ganglion cell layers of the retina. No bacilli were found in the retina, but the hemorrhage appeared to be due to general tuberculous infection.

Cords⁴ has reported two cases, and collected six others, all of which were probably tuberculosis of the retina. His two cases improved under tuberculin treatment.

Igersheimer⁵ saw three cases of retinal tuberculosis and two of his cases had pulmonary tuberculosis, just as my second case had.

Gilbert⁷ has reported three cases of periphlebitis, which he thinks show that tuberculosis disease of the anterior segment of the uveal tract may cause phlebitis of both the uveal vessels and the central retinal vein. In each case the tuberculin reaction was positive.

Fleischer⁸ reports a case of retinal periphlebitis occurring in a man of 36, who suffered from pulmonary tuberculosis. The age of this man is nearly the same as that of my first case. One eye showed periphlebitis with extensive hemorrhages. These were gradually absorbed with return of vision. A year later there was iritis, followed by secondary glaucoma, for which the eye was enucleated. Some of the veins were found filled with tuberculous débris.

In one of Harms⁹ cases of periphlebitis and retinal hemorrhages there was gradual improvement after a few weeks, and, although some lesions remained, vision rose to normal. This patient seemed to be in fair general health, but suffered from tachycardia on slight exertion and gave a weak positive general tuberculin reaction.

Oloff¹⁰ reports two cases of tuberculosis of the retinal veins. The patients were young men, sailors and robust. They gave distinct general reactions to tuberculin. Oloff finds these cases are not

benefitted by tuberculin treatment, but often do well under general dietetic and hygienic measures.

In one of the five cases of retinitis with massive exudation reported by Friedenwald¹¹ there was a marked tuberculin reaction.

In a paper on retinal tuberculosis by Otori¹² two cases seen clinically are reported, and also experiments upon rabbits concerning ocular tuberculosis. In the first patient the left eye was enucleated on account of a hemorrhagic inflammation involving the iris and cornea. With the microscope, the retina was found to be extensively destroyed, the nasal portion being entirely necrosed, and a number of typical tubercles being present. Tubercle bacilli were demonstrated. This is the first case of primary retinal tuberculosis in which tubercle bacilli have been found in the tissues. A modified staining method was used for the microscopic sections they were stained for from two to four hours with hot carbolfuchsin solution, then placed for a short time in a 0.5 per cent hydrochloric acid-alcohol with some tincture of iodine and washed in distilled water, then differentiated in a solution of picric acid with indigo-carmin (saturated aqueous solution of picric acid 200 grams, indigo-carmin 0.5 grams). The staining process was completed with alcohol and carbolxytol. The tubercle bacilli were only found in parts of the retina which were relatively little changed. They were especially numerous in masses of round cells along the veins of the retinal periphery, and could not be found at all in the uveal tract.

In the second case the left eye was enucleated on account of hemorrhagic glaucoma secondary to a severe plastic iritis. In this case the anterior half of the nasal side of the retina was necrosed. Tubercle bacilli were found in every part of the retina, and they were extraordinarily numerous in a large expanse of the equatorial region. The large colonies of bacilli in the retina were sharply limited by the pigment epithelium layer, no bacilli being found in the chorioid. They occurred in a few sections in the posterior part of the ciliary body, and were numerous on the optic nerve head. As regards the first case, Otori believes that the bacilli at first had their seats in the optic nerve head, and from there invaded the other tissues. The second case he believes to have been one of primary retinal tuberculosis. He regards the secondary infiltrations in the uvea and also in the optic nerve trunk of both cases as in the nature of a toxic inflammation.

The experiments performed upon rabbits included (1) inoculation into the common carotid artery; (2) injection in the veins of the ear; (3) inoculation into the common carotid artery with simul-

taneous division of the ciliary vessels; (4) inoculation of the common carotid artery with ligation of the common jugular vein of the same side; and (5) inoculation into the common carotid artery with ligation of the common jugular vein. With none of these methods was a tuberculous localization of the disease obtained, although by some of them a tuberculous infection was produced in the uveal tract. From these experiments Otori concludes that the rarity of primary tuberculosis does not depend merely upon peculiarities in the retinal circulation, but rather upon a natural lack of disposition of the retina towards primary tuberculous infection. The clinical cases reported are to be considered as arising by way of a perivasculitis of the retinal veins, directly caused by migration of tubercle bacilli into the lymph channels of the retina.

Hemorrhage from the retinal vessels in young adults is almost always due to tuberculosis of the retinal vessels. Axenfeld and Stock¹³ expressed this opinion six years ago. It is, perhaps, needless to state, at this point, that I am excluding all cases of trauma, early arterio-sclerosis, syphilis, hemophilia, cardio-vascular diseases in general, thrombosis or embolism of the central artery or vein, nephritis, etc. One should always be on the alert for changes due to syphilis and this disease should be excluded in all cases of retinal hemorrhage. In the past too many cases of tuberculous disease have been regarded as syphilitic and treated with mercury and potassium iodide, when they should have received injections of tuberculin. Hemorrhage here is just as characteristic of tuberculosis as hemorrhage from the lungs in the pulmonary form of the disease. Knapp¹⁴ has reported two cases in which hemorrhage from the retinal vessels, into the vitreous, was a very prominent symptom of the tuberculous disease. His two cases are as follows: "Case 1—The ophthalmoscope showed a swollen and inflamed optic disc. The swollen nerve head seemed displaced by an illy-defined chorio-retinal area, up and in, surmounted by a small hemorrhage; up and out and next to a blood vessel, there was a superficial, round, white focus; a smaller, though similar, patch was seen below, a short distance from the disc. The macular region was occupied by a perfect star-like figure. The spokes were composed of glistening, silver interrupted lines. The diagnostic dose of 3 mg. O. T. produced two days thereafter many round, white areas about the disc and the larger retinal focus. He remarks that it is uncertain whether the tuberculin injection made these small foci ophthalmoscopically visible or whether they represented the dissemination of the general focus. He further states that rapid and continuous improvement,

under specific tuberculin treatment, confirms the diagnosis of tuberculous lesion."

"Case 2—In this case the ophthalmoscope showed white exudate, composed of round areas, which surround the course of the macular vein. This vessel was unevenly dilated and there were small hemorrhages on the exudate. Three mg. O. T. was followed by focal reaction and vitreous haze."

"A chronic form of chorioidal tubercle, 'Obsolescent tubercle,' in strumous children, first described by Sydney Stephenson¹⁵ and considered by him to be tuberculous, has been definitely determined to be tuberculous, by use of tuberculin diagnostic test (T. Harrison Butler and Karl Koller of New York). The latter described the reaction to be opacity of the vitreous; change of color of the tubercle, more reddish."

In fact, the hemorrhage into the vitreous if more marked or subhyaloid if slight, with subsequent loss of vision, may be the first intimation the patient has of the disease. On the other hand, the hemorrhages may recur several times, especially if only one eye is involved, before there is sufficient obscuration of vision to attract the patient's attention. This was undoubtedly true in my first case reported in this paper.

Fuchs¹⁶ states, in the last English edition of his book, as translated by Duane, that "hemorrhagic retinitis is due, for the most part, to diseases of the retinal vessels; many of these cases are probably identical with those of thrombosis of the central vein, as described on page 549." However, he doesn't mention tuberculosis as a cause.

George E. de Schweinitz¹⁷ mentions tuberculosis as one of the many causes of retinal hemorrhage, and he refers to Dimmer's classification. Roemer¹⁸ mentions the fact that tuberculosis may be present in a patient with retinal hemorrhages without being the cause.

One striking feature of the disease is the fact that such cases rarely show other evidences of tuberculosis, even after a careful and thorough physical examination by one or more competent internists, and they often look the "picture of health." It is, therefore, necessary to make a tuberculin test, as Posey¹⁹ has mentioned, before the diagnosis can be made. The second case reported in this paper is an exception to this rule. There may be deep seated tuberculous glands somewhere in the body or one or more very small tuberculous foci deep in the lungs.

At least the intraocular tuberculosis is endogenous in its origin

and is only one of the tuberculous foci within the body, as Gamble²⁰ has mentioned. In any event, these do not show, even in a very careful physical examination, but these isolated tubercles may rupture into a blood vessel and produce infection of the retinal vessels by metastasis. This, at least, seems to be the most logical explanation at the present time. However, these patients do, in many instances, react to tuberculin and give not only a local and general reaction, but a focal reaction as well. A mild general or local reaction in adults, as is now well known, is of very little importance, because so many adults will react to tuberculin. For instance, in Vienna, ninety per cent of the adult population will react to tuberculin.

A positive history of tuberculosis is very difficult to obtain in health resorts, especially in Colorado, except in the last stages of the disease, as Jackson^{21 22 23} has previously mentioned. For this, as well as for other reasons, already mentioned, patients with recurrent hemorrhages from the retinal vessels should receive very thorough examinations from ophthalmologists, internists, etc., because so much depends upon a proper diagnosis made early.

Another symptom, which is just as important, is the vasculitis and perivasculitis with fibrosis about the vessels. The fibroid changes undoubtedly occur subsequent to the hemorrhages, although both go "hand in hand" in any given case and both lead ultimately to the condition known as retinitis proliferans or proliferating retinitis.

Mayou²⁴ calls attention to the fact that the infection may gain entrance to the retina along the optic nerve sheath and he reports a case to illustrate his point. The fundus presented an appearance not unlike albuminuris retinitis with exudates.

Parsons²⁵ explains this by saying the "Transmission by the lymph stream is probably the commonest mode of infection, so that the sheaths suffer most frequently and worst."

"Manz²⁶ has described, under the name of retinitis proliferans, an affection in which dense masses of connective tissue extend out from the retina into the vitreous and cover a portion of the fundus—in fact, even the papilla itself. Into these masses run new formed vessels from the retina. For a number of these cases it is probable that these masses of connective tissue have been preceded by hemorrhages which were poured out from the retina into the vitreous and afterward became organized." However, he doesn't suggest the possibility of tuberculosis.

Retinitis Circinata, as described by Fuchs²⁷, is doubtless only one

form of an atypical type of proliferating retinitis and is due, probably, to tuberculosis of the retinal vessels. The fibroid changes are again characteristic of what we know concerning tuberculosis elsewhere in the body, *i. e.*, in the lungs, larynx, etc., and represent nature's efforts to arrest further progress of the disease. However beneficial these changes may be in other organs, they are more or less destructive of vision when they occur in the eye.

Therefore, the therapeutic administration of tuberculin, proper diet and an outdoor life will do much, in many of these cases, to save the remaining vision and will often restore some of that which has already been lost. Jackson^{21 22 23} has undoubtedly saved the vision of two of his cases by this treatment. On the other hand, Black^{28 29} has a patient who hasn't done well, in spite of all his skillful treatment. This case is the exception, as there may be a mixed infection present. New tuberculin (T. R.) should be administered in doses of 1/10,000 to 1/2,000 mg. It is best to begin with very small doses and gradually increase. The injections should not be repeated in less than two to four or even six weeks. We should give too little, as Parker³⁰ has mentioned, rather than too much. Gamble²⁰ has emphasized this, too. An exception to this is when tuberculin is given for diagnosis. Then it may be repeated every three, four or five days until a reaction is obtained. If old tuberculin (O. T.) is used 1/10 to 1/2 mg. may be injected at the same intervals.

However, tuberculin is like all other remedies; it will not prove suitable for all cases. "Von Hippel³¹, out of his large experience, has called our attention to the fact of the common relapses of the disease, following, or in the course of, tuberculin treatment."

"Among seventy-five cases of tuberculosis of the iris and ciliary body, relapses occurred in fifteen and at intervals of from three months to three years after end of first course of treatment. In 115 cases of tuberculosis of the cornea, there were twelve relapses. In eighteen cases of kerato-iritis, three; in eight cases of conjunctivitis, two. No relapses in cases of sclera or chorioid. The total number of relapses were thirty-two out of two hundred and forty-three patients. A long interval must elapse before one is justified in considering tuberculosis of the eye definitely cured."

In fact, many patients object seriously to its use, especially if they experience the slightest reaction, even locally. This was true with the first case in this paper. I agree with McCool³² when he says "he would almost prefer to be the second oculist consulted rather than the first, aside from the satisfaction of having made the

diagnosis, because such patients often seek advise elsewhere." This unpleasant experience may often be avoided by injecting tuberculin in very small doses and at long intervals. This is very important to remember for the following reasons:

First, moderately severe or severe reactions can be avoided. In most injections there should be only a slight local reaction, if there must be any reaction at all, because if patients respond with a moderate or severe general reaction they are very liable to have new retinal hemorrhages, as evidence of the focal reaction, with loss of more vision. This is more likely with the first few injections than after the patient has been under treatment for awhile.

Second, the psychological effect of small doses is desirable, since patients are much more likely to continue this important line of treatment. Remember, too, that this treatment requires months, or even several years, but even this prolonged treatment is better than blindness.

The administration of tuberculin has been left very largely in the past to the internist, who usually has only a limited knowledge of fundus diseases. Much more progress along this line can be made if ophthalmologists will, at least, direct the treatment, as the fundus should be examined the second and third day following each injection of tuberculin, especially if there is any reaction. This is very necessary until the diagnosis is well established, but isn't, perhaps, quite so necessary every time thereafter.

The fact that tubercle bacilli can't be obtained for smears, for very obvious reasons, counts for nothing in the diagnosis. Collins³³ has reported eighteen cases in which the eye has been enucleated for uveal tuberculosis. In one of these cases tubercle bacilli were found, in another their presence was doubtful, and in four cases they were looked for and not found. In one case a successful inoculation was made in the eye of a rabbit. But in fifteen cases the diagnosis seems to have rested on the symptoms, clinical course, and pathologic histology. As Jackson^{21 22 23} stated, it is experiences like this that have caused the staining and search of suspected tissues for bacilli to be ranked below inoculation tests, as a foundation for the diagnosis of tuberculosis. The diagnosis of tuberculosis of the retinal vessels, by the diagnostic use of tuberculin, is more positive than the diagnosis of a syphilitic iritis, because a patient gives a positive Wasserman. However, we shouldn't have undue faith in tuberculin, even in positive clinical tuberculosis, as this test can't always be depended upon. Von Hippel³¹ reports a case in which the enucleated eye was found full of tuberculous masses; yet the gen-

eral reaction to old tuberculin was only obtained from the sixth injection containing 5 mg.

Perhaps three cases to illustrate the ophthalmoscopic findings, subjective symptoms, diagnosis, etc., will be of interest. The first one is so typical it is what the German or Austrian ophthalmologists call a school or text book case:

Mr. A., age 32, farmer, weight 190, looks well and feels well, first examined March 31st, 1916. He gave a history of failing vision O. S. since January 8th, 1916. At first, when his vision began to fail, he saw a streak before O. S., but, as the sight became worse, he scarcely distinguished even the streak. V. O. D. 15/20— and J. No. 1 and V. O. S. 2/100 and not even J. No. 11.

The anterior segment of each eye was negative and the right fundus was negative. However, examination of the left fundus revealed the following: Vitreous very hazy, disc looks very hyperaemic, as one would expect through a hazy vitreous, and there were many hemorrhages about the retinal vessels with areas of retinal proliferation. In this case, as in the other cases of retinal tuberculosis, the organization of the exudate, with the formation of fibrous tissue, as manifested by the proliferating retinitis, goes hand in hand with the hemorrhages. The disease in this patient must have lasted longer than the history indicated.

The hemorrhages were most numerous in the nasal, inferior nasal and inferior portions of the fundus. The largest streak of retinitis proliferans was about one of the inferior nasal vessels. The accompanying illustration shows this better than any description can do.

He denied venereal disease and the luetin test was negative. He gave a very decided local and general reaction to 1/10,000 mg. of old tuberculin and a slight, doubtful focal reaction. A Wasserman test was advised in spite of the negative luetin test and, in case the former should be negative, as it probably would be, treatment with tuberculin. He refused to have the tuberculin used or the Wasserman test made, as he was prejudiced. The following is the report from his physician, Dr. Clay E. Giffin, to whom he was referred: "Chest and heart negative; abdomen negative; blood negative, and blood pressure 127 systolic by Tycos instrument. He gave a general, local and a slight focal reaction to an intracutaneous injection of old tuberculin. (O. T.) Patient refused to return for subsequent tests because of a general sense of well being, which seemed to make further examination useless."

Case 2—Mrs. B., age 27, married, mother of two children and the

chief support of the family, as her husband had been blind several years following the explosion of a misspent shot in a mine.

First examined August 24th, 1916. She stated that the sight failed suddenly in O. S. one week prior to this. She had V. O. D. 6/6— and J. No. 2. V. O. S. was reduced to L. P. with good projection, but she was unable to recognize or count fingers.

The anterior segment of each eye was negative and the right fundus was negative, but the examination of the left fundus revealed a massive hemorrhage in the vitreous, so that the details of the eye grounds couldn't be recognized.

Upon close questioning this patient admitted that she had bronchitis, active pulmonary tuberculosis and raised sputum each morning. A thorough examination by her family physician, who is a competent internist, revealed an active tuberculous lesion in the apex of the right lung. The report of Dr. O. M. Gilbert is as follows: "Aside from eye symptoms, patient complains of fever, weakness, cough and expectoration. She has two children, 8 and 10 years old, but has had several induced miscarriages."

"Fall of 1912 had an abscess on the kidney and was ill for several months, then well until the fall of 1913, when she was 'nervous and run down' and had a hacking cough. Never well since nor free from cough. Spring of 1915 had five pulmonary hemorrhages of a pint or more each. Ran a fever ever since and has lost thirteen pounds."

"S. P. Temperature 100.8; pulse 116; weight 124; blood pressure 110/70; dyspneic on exertion; coughing and expectorating freely. Occasional night sweats, no more hemorrhages."

"*Examination*: Considerably emaciated, no edema, pallor, jaundice nor pigmentation. Pupils and reflexes negative. Urine negative; blood luetin negative. Sputum showed a great many tubercle bacilli, few streptococci and staphylococci. Heart negative. Lungs: Right—Consolidated in apex and infiltrated to third interspace, with probably small cavity behind the second rib. Numerous crackling and small bubbling rales throughout this region and posteriorly down to inferior angle of scapula. Left—Consolidated in upper half with large cavity from first to third rib, infiltrated throughout the remainder except the lower margin laterally. Tuberculin tests not given."

Dr. Ross C. Whitman, Professor of Pathology, University of Colorado, reported the blood Wasserman negative.

Case 3.—Mr. C., first examined September 13th, 1916, and gave the following history: Age 20, single, states that his left eye has



been slightly inflamed for the past few days and that objects look smoky with this eye. He states that he can see the outline of people, but cannot recognize their faces. He thinks the sight failed rather suddenly in O. S. a few days ago. He denies tuberculosis and venereal diseases, but states that he was quite nervous before coming to Colorado.

V. O. D. 6/5 and J. No. 1; V. O. S. 6/6 plus and minus and J. No. 2.

The right fundus was negative, but the examination of the left revealed fresh blood in the posterior portion of the vitreous chamber, so that it was impossible to see the details of the retina and disc very distinctly. The disc "looked red," as one would expect through a hazy vitreous. There was enough blood in the vitreous, so that I could not detect the vessel or vessels from which the hemorrhage had occurred. While I could see the disc reasonably well, the vision was much better than one would expect from the objective findings in the fundus.

The following report is from his family physician, Dr. O. M. Gilbert: "In addition to his eye symptoms he complains only of having had persistent colds quite frequently, occasional gastric distress shortly after meals, which disappeared upon quitting coffee; also having been run down during the past spring and summer. S. P. No cough. Temperature 99.2; pulse 104; weight 122."

"Examination: No edema, pallor, jaundice nor pigmentation. Fairly well nourished, but not muscular. Pupils, reflexes, gait and station normal. Heart and lungs negative. Abdomen negative, except for a deep tenderness over the appendix. Luetin test negative; urine and blood negative. Blood pressure 109 systolic, 70 diastolic."

"Tuberculin test:

September 14th. O. T. .0001 mg.—only slight reaction.

September 17th. O. T. .1 mg.—slight general but no local reaction.

September 25th. O. T. 2 mg.—slight general reaction, but no local reaction.

September 30th. O. T. 10 mg.—more marked general and local reaction.

Temperature 99.2, no focal in lung."

Dr. Ross C. Whitman, professor of pathology, University of Colorado, reported the blood Wasserman negative.

After being given diagnostic doses of tuberculin, he gave only a very slight, rather doubtful, local reaction, with a mild local and general reaction when the dose reached 10 mg. This failure to react to the smaller doses was probably due to the fact that a very small, isolated tuberculous focus in one lung, in a lymph gland, etc., is not large enough to produce decided local or general reaction. This is certainly true with a small tuberculous focus in the retina, as the general toxemia from such a small focus is practically nil.

I have been able to find in the literature twenty-nine cases of retinal tuberculosis, which, with my three cases, makes a total of thirty-two. I perhaps could have found other cases in the literature and among my own records, but I have purposely excluded all doubtful cases.

In conclusion let me call your attention to a most excellent symposium upon Ocular Tuberculosis by Jackson, McCool, Posey and Gamble, read before the Pacific Coast Oto-Ophthalmological Society, June 17th, 1915, and published in the *Ophthalmic Record* for January and February, 1916. I have quoted freely from this symposium and I believe every ophthalmologist should read the articles comprising it.

Physicians' Building.

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PREVENTION OF INFECTION OF THE CORNEA.*

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The possible prevention of corneal infection is in direct ratio to the care and skill in the primary treatment. The laminated arrangement of the corneal layers, and the natural barrier that each layer proves to be against the invading bacteria, with the consequent lateral spread of the infection, and the necessity of preserving every bit of the cornea, especially over the pupillary area, demands the most skilful treatment. Compared to the great number of corneal injuries, infection is rather rare, and as the replies to my circular letter indicate, nearly all infections follow faulty first aid, whether at the hands of the patient himself, his friend, or the "first-aid man."

Every normal conjunctival sac contains bacteria which, however, are benign. Parsons says that Staphylococci are constantly found in the skin at the edge of the lid and sometimes in the normal conjunctival sac. Streptococci and Pneumococci are never found in the normal eye.

The prevention of infection then depends on the kind of bacteria present at the time, and the possibility of destroying them without at the same time doing any further injury to the corneal tissue, than is already present.

Of nearly all infections only a few kinds really need to be considered. Kuffler, Parsons, give practically the same order of infective causes: 1. Morax-Axenfeld diplobacillus, alone or with pneumococci. 2. Pneumococci. 3. Staphylococci. 4. Gonococci. 5. Diphtheria. 6. Streptococci.

In order to reach and destroy the bacteria without destroying the cornea the drug must be able to penetrate through the epithelium and the corneal lamellae, and infiltrate the tissue faster than the bacteria can advance, and it must not precipitate in or by serum or albuminous substances.

It is, of course, understood that before any treatment is begun the cornea is completely anesthetized with cocain or a substitute, and blanched with adrenalin so that there are no tears to wash out the medicaments before they have had opportunity for full action.

As preparations of zinc are specific for the Morax-Axenfeld diplo-

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bacillus, the preparation of this drug that meets the above requirements of penetration or prolonged retention in the tissues should be selected. Wolff, in August, 1914, produced Fluorescein-Zinc, which contains 16 per cent zinc, and does not precipitate with serum or albuminous substances. This powder is rubbed in the conjunctival sac and remains in the conjunctiva, where it gradually dissolves and slowly liberates the zinc for about a day; the patient during this time weeping yellowish-green tears. Gradle also reports excellent results, only one or at most two applications being necessary. Any other of the zinc salts may be used, but they must be frequently repeated in order to obtain the same results as is obtained by one application of Fluorescein-Zinc. Fortunately in this country the Morax-Axenfeld infection is quite rare, so in most injuries of the cornea we entirely ignore this germ as a causal factor.

For the ordinary pus bacteria, staphylococci and streptococci, the early treatment is essential. As yet we know of no positively specific drug which will act on these bacteria in the cornea any more or any different than they do on other tissues of the body.

Iodin and formaldehyd if used early are the most generally efficient. Formalin does not form insoluble compounds with the tissues. (Wood.) Tr. iodine seems to cause no damage to the healthy cornea, even when applied in considerable strength and excess. (Fuchs.) The bactericidal power of formalin and iodine is too well known to need mention here. The efficiency of phenol, trichloroacetic-acid, etc., is equal to iodine or formalin, but these are actual caustics and do not stop at the diseased tissue, continuing into the healthy cells precipitating the serum or coagulating the albumen, depending on their chemical action. Phenol, nitric acid, trichloroacetic-acid, etc., stop their own advance by coagulating the albumen, and destroying the tissue they touch, while sulphuric acid, caustic soda, and the actual cautery do not stop by producing a coagulation limit. These drugs will destroy the bacteria but at the same time they destroy the corneal tissue with which they come in contact.

The iodine or formalin as well as any other drug must be applied to the previously curetted, cleaned, and dried surface of the wound, and to be applied until decided effect is obtained, the lids to be kept apart long enough so they can thoroughly work into the corneal tissue.

If the actual cautery is used the point should not touch the cornea, but be held close to it at a dull red heat, to produce what is called "chaffage," the heat destroying the bacteria but not the healthy

corneal tissue. When the actual cautery comes in contact with the corneal tissues we have destruction of essential elements.

Corneal wounds with possible gonococcus infection, e. g., during the course of an ophthalmia, must have the silver salts. Opinions as to choice of preparation differ very much, yet are almost the same. The silver nitrate solution must be strong enough to penetrate into the superficial tissue, because the gonococci are within the cells. It must also have long enough time to work before the tears begin to wash it out, or to neutralize it by the chemical action of the sodium chlorid in the tears. Silver nitrate destroys the superficial corneal and conjunctival epithelium by coagulating the cellular albumen, which in the minds of many physicians is not at all harmful. However, it is a fact that most doctors prefer argyrol because of its intense penetrating action on the tissues, and its freedom from irritating properties, although it is claimed it possesses no bactericidal powers. It is argued that argyrol will exert the antiseptic effects of silver (30 per cent of silver in argyrol), in the deep submucous structures, where, in most pathologic conditions, pathogenic organisms find and maintain lodgment in spite of energetic measures to eradicate them. Therefore, if argyrol is used it must be strong enough and long enough to penetrate deep into the corneal tissue. There is no advantage in using a solution weaker than 50 per cent.

If not retained in the conjunctival sac continuously for some time, it can have no chance to penetrate the cornea. A weak solution is no less painful, or, if you please, a strong solution is not more painful than a weak solution, provided the solution is made fresh from fresh unexposed argyrol. It must be used fresh, and kept away from the light just the same as you would care for a silver nitrate solution. To me it seems absurd to use a weak solution of argyrol as a wash for one time or for a single application when we know that it can have no effect on the bacteria unless it have time and concentration enough to penetrate the tissues, and that takes some time. By using it as suggested by Dr. Morrison you can avoid the "muss" about the argyrol bottle. This powder can be made in any strength.

Morrison's prescription is: Argyrol, dram $\frac{1}{2}$; Pulv. Acacia, drams $2\frac{1}{2}$. I prefer: Argyrol, dram 1; Pulv. Acacia, drams $2\frac{1}{2}$; or better, Argyrol, Pulv. Tragacanth, aa dram $\frac{1}{2}$. Free crystals of argyrol thus being brought into direct contact with the conjunctiva and cornea, the dilution depending on the subsequent flow of tears, and length of action to the time it takes to wash it out.

Puscariu claims optochin is superior to silver nitrate in ophthalmia.

Collosol argentum, a cherry-red liquid, contains silver in metallic state, kills all known germs in 6 minutes, in laboratory experiments.

Injuries of the cornea by objects carrying diphtheria bacilli, of course, are to be treated with antitoxin, and need not be discussed at this time.

Unthoff and Axenfeld (1896) discovered that the bacterial cause of the typical *ulcus serpens* or the ordinary corneal ulcer was the ordinary pneumococcus. Up to 1911 the only treatment of corneal ulcers or their prevention was chemical or thermo-cautery. At that time Morgenroth and Levy showed that ethyl hydrocuprein hydrochlorid (called in the trade Optochin), a derivative of quinin, for the first time could cure a bacterial infection, the effect depending not only upon the concentration but especially upon the time of action. Morgenroth demonstrated the astounding clinical results from the use of optochin that it could kill the pneumococci which develop within the cornea without harming the corneal tissue. Ginsberg similarly proved this by introducing virulent pneumococci organisms within the corneal lamellae and a 1 per cent solution killed the germs without any effect whatsoever on the corneal tissue. One-half per cent solution used by subconjunctival injection did not result in adhesions forming between the sclera and the conjunctiva. It has no effect on staphylococci, or the Morax-Axenfeld bacillus. It does not leave a thick scar as does the galvano-cautery, which has been entirely discarded at the clinic of Prof. G. von Schleich (Tübingen) since the introduction of optochin. Pneumonia "carriers" can be made free by its use preliminary of any eye operation or in the presence of erosions or foreign bodies. The relief of the intense photophobia is not due to its anesthetic, but to its bactericidal action. It is also a prophylactic in preventing infection of artificial erosions of the cornea.

As zinc is a specific for the Morax-Axenfeld diplobacillus with optochin we now possess absolute chemo-therapeutic specific for nearly all forms of corneal infections (Axenfeld).

The value of any therapeutic agent can better be judged from its effect in certain severe cases than from a large series of cases.

Case 1. Laborer, age 63. Chronic glaucoma, with degeneration, typical case of two years' standing; periodic painful attacks. Nov. 2, 1915, presented himself with typical virulent *ulcus serpens*, in center of cornea, $\frac{1}{8}$ inch in diameter almost reaching to Descemet's

membrane, with ragged edges and corneal infiltration. Hypopyon filling lower third of anterior chamber. Eyeball stony hard. Typical hopeless case that would surely go bad, with any kind of treatment, cautery, Saemisch's incision, or Kuhnt's conjunctival flaps, especially in the presence of the glaucoma absolutum. An eye that ought to be enucleated. Ulcer was curetted, wiped dry and clean, and the bottom filled with crystals of optochin, and firmly pressed into the tissue. The crystals if packed in deep can not be washed out by irrigation, and will remain a long time producing maximum effect as the tears dissolve them. The same was done on the second and fourth day when there was decided improvement in the ulcer, and the hypopyon was less. A 2% solution was used once a day for two weeks when cornea was healed and hypopyon absorbed. The optochin crystals produced temporary whiteness of the edge of the ulcer, but this was gone by the next day.

Case 2. Farmer, age 38. While cutting off the fang of a pig, the tooth struck the center of the cornea producing a typical ulcer of extreme virulence. I saw him on the fourth day after the injury with typical radiating striae hypopyon, iritis, etc., and extreme photophobia. Ulcer curetted, cleaned and dried, optochin packed into the ulcer first, second and fourth day. Healed in twelve days with almost no scar—but poor vision on account of central location.

Case 3. Farmer, four days before I saw him he ran a cornstalk in cornea. Piece of stalk still in tissue almost to Descemet's membrane, and on a slant. Typical ulcer, corneal striae, hypopyon, iritis, intense photophobia. Ulcer packed with optochin, first, second and fourth day. Well in ten days with very small scar and good vision.

Case 4. Tobacconist, same condition as in case 3, except the injury was caused by a rib of a tobacco leaf. Treatment the same. Went back to work on the third day of treatment and visited me every day but received no treatment after the second day. In ten days eye was well.

These selected cases are the kind that usually go bad. I have used optochin repeatedly in ordinary ulcers after foreign bodies, in which any treatment is just as effective, while in the above cases no treatment with which I am familiar would have given me anywhere near the good results obtained.

H. Knapp, says: "If statistics are large enough everything is possible, from suppuration to sympathetic disease of the other eye." J. A. Donovan (Butte, Mont.) writes me: "All you require is a

sufficient number, and it may take years—but 'murder will out.'"

In spite of the almost unanimous opinion of those who answered my questions, that infection of the cornea can not always be prevented, I think the studies brought forward in this paper will permit me to say that, with the patient under anything like normal conditions, every infection of the cornea can be prevented, following superficial erosions or after the removal of foreign bodies, whether the bacteria were brought to the tissue by the agent of injury, or from the conjunctival or lacrimal sac.

SUMMARY OF REPLIES TO CIRCULAR LETTER.

1 and 2. To prevent infection of the cornea.

Phenol (J. Green, Jr.).

Electrocautery.

Argyrol.

Silver nitrate (Peter Callan).

Trichloroacetic acid (G. de Schweinitz, H. Gifford).

Formalin, 10% (Weeks).

Bichlorid solution and ointment—White's (W. H. Wilder).

Tr. iodine (Würdemann, Oscar Dodd).

Xeroform (A. Alt, A. E. Ewing, St. Louis).

Nitric acid.

Tricresol (W. C. Bane).

Permanganate of potash.

Silver iodid, freshly prepared.

Mercury oxid ointment.

Optochin (Gradle and Bellows).

Iodosyl ophthalmic ointment.

Zinc sulphate.

Mercury cyanid by subcapsular injection (H. W. Woodruff, Joliet, Ill.; E. L. Jones, Cumberland, Md.).

Copper sulphate in central ulcers (A. E. Prince).

Dionin.

Zinc chlorid, gr. 1 to oz.

Fluorescein zinc (Gradle).

Chaufrage (A. E. Prince).

Irrigation with solutions of: Boric acid; Bichlorid; Mercury Cyanid; Argyrol, 5 to 50%; Mercury Iodid.

3 and 4. To bandage or to let the eye be open after removing foreign bodies.

A. If infected—Bandage 55%; open 45%.

B. Not infected—Bandage 40%; open 60%.

5. *Sterilizing spud.*

A. Phenol, alcohol, 60%.

B. Boiling or flame, 40%.

6. *Infallible rule to prevent infection.*

By unanimous opinion impossible.

7. *Should man who has had F. B. removed go right back to work?*

Permit to go back, 48%; refuse to go back, 52%.

My observation is that, if the lids are kept closed by pad or bandage until effect of cocain is worn off and the tears begin to flow, the patient does not seem to run any material risk in returning to work if he can see well enough to do his work, and can stand the pain. If he can not see well or has pain I insist on him staying home and using hot compresses. If the eye is sore the next morning I insist that he return for inspection, otherwise to go back to work. On the first sign of infection I insist that he come to my office. (Of course, all this after primary treatment as outlined in this paper.)

8. *Efficiency of the "first aid man" trained for the work.*

The great majority of answers are that he is not efficient. A few of the opinions will show how they are regarded:

"Worse than useless." "No matter how well trained he may be, he should not be permitted to attempt to remove F. B. from the cornea" (John Green, Jr.). "Usually where most infections come from." "I think he is a menace to the man with an injured eye." "Seldom do much good." "He makes most of the bad cases." "Generally not satisfactory" (Peter Callan). "Not to remove stuck bodies" (Magee). "Has no place in corneal injuries." "Where lesion is superficial, otherwise not" (Gifford). "O. K. if he will bandage eye and not pick at it."

"As a rule they bungle the case." "Safer in the hands of the trained physician" (Wilder). "The workman who removes F. B. from the eye ought to be in jail." "Better than untrained, but something to be desired still" (B. F. Andrews). "Do more harm than good" (F. Todd). "*I know of no trained first aid men except medical men for mote removers*" (Würdemann). "Wish he would let all cases alone." "From the number of ulcers I see resulting, I think something is wrong" (A. H. Andrews). "They cause unnecessary traumatism" (O. Todd), and generalized by the opinion of Gradle "D—n Poor."

On the other hand these opinions: "Of inestimable value." "He usually knows what cases to send to the oculist, he is not slow to send them because his job depends on his using judgment" (A.

E. Prince). "Some of these fellows become very efficient, and useful" (Donovan). "Some do exceedingly well, others not" (de Schweinitz). "He could be made to be efficient and of much value. He could soon learn to classify the cases and to treat only those within the scope of his ability" (Weeks). "His services are essential" (J. E. Shore). "A man could be trained to do safe work" (F. P. Calhoun).

Conclusions.

(1) Every injury of the cornea can be kept from becoming infected, and, if infected, the wound can be rendered sterile without material injury to the tissue beyond the original trauma, if seen soon after the injury. The treatment to depend on the bacterial findings, viz.:

(a). Morax-Axenfeld diplobacillus—Zinc Fluorescein, or zinc salts.

(b). Pneumococcus—Optochin.

(c). Streptococcus and Staphylococcus—Iodin or formalin (Chaufrage).

(d). Gonococcus—Argyrol or silver nitrate.

(e). Diphtheria bacillus—Antitoxin.

(2) The eye will do just as well with, as without, a bandage after the removal of the F. B., whether infected or sterile. The final result will depend on the treatment as outlined in 1.

(3) Spuds can be sterilized equally well, if properly done with phenol and alcohol, or by boiling long enough.

(4) Just as good results are obtained if patient returns to work after the removal of F. B., as if he waits till the next day, if primary treatment is correct. The eye to be kept closed until the cocain anesthesia wears off, and the tears begin to flow.

(5) The ordinary first-aid man is to be condemned as dangerous in removing F. B. from the cornea. By careful training some can be made efficient, but most of them are, as Gradle says, "D—n poor."

The use of atropin, subconjunctival injections, application of heat and cold, and other self-evident measures of symptomatic treatment is taken for granted in each case. This paper deals with the prevention of infection of the cornea—not the treatment or care of after-results.

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STATE LEGISLATION CONCERNING OPTOMETRY.

(Paper No. 6)

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The subject of optometry is difficult to frankly discuss as it is one upon which widely different views are entertained by honest and competent observers. The oculist feels that the treatment of refractive errors is practicing medicine, and can be safely undertaken only by a graduated and licensed physician, while the optician feels that the fitting of glasses is largely a mechanical and mathematical problem, and can be performed with entire satisfaction by a properly qualified optician or optometrist. This is the vexed question that has been bitterly discussed on both sides for years, and is not yet settled. In all fairness, however, it must be acknowledged, that, at least so far as practical results are concerned, the opticians have accomplished more than the oculists, for already 39 states have passed laws governing the practice of optometry. The oculist claims that it is impossible to draw a line between the mechanics of refraction and ocular pathology, and that the two are so intimately interwoven, that it is dangerous to undertake to separate them. They are perfectly willing to admit that a well educated optometrist can fit glasses satisfactorily and correctly in a large proportion of cases, but they claim that in many instances no one but a specially educated medical man, can be a safe advisor. They insist that no one can correctly solve many refractive errors, without a mydriatic, and that the use of a mydriatic, by a non-medical man, is not only illegal, but often dangerous. The optometrist urges that licensed optometrists, should be well educated men, who have graduated at high grade optometrical colleges, and have been duly licensed by a state board of examiners to practice their profession. They claim that under these conditions they are quite competent to recognize pathological ocular conditions, and to abstain from meddling in such cases. Most of them claim that mydriatics are unnecessary, and others hire some medical man (of diminutive self respect) to use the mydriatic, preparatory to the correction of the refraction. They further claim that the observance of adequate optometrical laws will exterminate low grade and uneducated spectacle venders, and cheap bogus optical colleges, which will result in bestowing a benefit to the public, which has long suffered from the evil consequences of their existence. It may be said in passing that this claim must

be shadowed in doubt, for the practical results in states having optometrical laws, are not always harmonious with the requirements of the laws. Underneath all these humanitarian, and scientific arguments upon each side of the question, will be found the personal element, the financial "milk in the cocoanut." This is hard to acknowledge, but it is nevertheless true. Some men there are, of course, whose professional and financial positions are so secure, as to render them indifferent to the matter; others are really able to contemplate the situation with pure Utopian philosophy, but the majority of practical bread earners fear a diminution of their income, and quite naturally seek to avert the impending disaster. Of course, they believe that their side of the argument is correct, irrespective of money, but the financial aspect of the situation cannot be ignored. The oculist dreads the division of his income with the optometrist, and the small spectacle vendor shudders at the thought of the withdrawal of his entire financial support. The high grade educated optometrist seems to be the only gainer in the transaction, for he not only accumulates the profits of the small spectacle vendor, etc., but he also forces the oculist to surrender a part of his income as well. He is the beneficiary, and *he* is the one who is forcing optometry laws upon the different states. Being the only gainer in the deal the motives controlling his public spirited crusade may certainly be regarded with some suspicion. Another reason for opposition from ophthalmological sources, can be found in a natural suspicion concerning the ultimate intentions of the optometrist. The fear is, that the optometrist may use this primary move as a wedge to an ill-defined ophthalmological practice. In these days, when osteopaths, chiropractors, science healers, etc., seem to flourish, in spite of medical practice laws, it needs but little imagination to conceive of encroachments by optometrists upon ophthalmology, until the public perceives but little difference between oculists and optometrists. Indeed optometrical literature has already appeared, forshadowing such developments. It should be clearly understood, that while the opposition to the optometry movement is endorsed by oculists to a certain extent on account of some of the reasons just recited, the *real* opposition is of the highest character, and consists in a conscientious conviction that real refraction work is practicing medicine and that no one should be allowed to trespass, on this territory, without proper qualifications. They feel that the oculist should prescribe glasses and that the optician should adjust and sell them; neither profession should usurp the functions of the

other. Feeling thus it is astonishing how little interest the medical profession and even the oculists manifest in blocking optometric legislation. The opticians are at the capitol in force and with money; they maintain a lobby; they never give up; but the oculists are few in number, and financially weak; they seem to expect somebody else to fight their battles for them, or that providence will intervene, because they believe their cause to be just. Besides this many of the reputable general practitioners do not take the same view of the matter as is entertained by their ophthalmological colleagues, and either pursue a negative policy or come out openly and espouse the cause of the opticians. This seems strange, but it is nevertheless true. Too much blame must therefore not be attached to legislators and governors for passing optometry bills, especially as many of them have been imposed upon by some of the various grades of opticians, and they therefore rather naturally regard the proposed optometry bill, with its exclusive and educational features, as a step upward, and as an act of legislature calculated to purify the optical ranks, and protect the people from imposition and fraud. This is the view that many take, and they regard ophthalmological opposition as selfish and illogical. Of course, ophthalmologists know differently, but then they are educated, and they are not legislators. Besides most of them are not good business men, and they are not lobbyists nor practical politicians, so it happens that from one cause or the other states have adopted optometry laws, and it is more than likely that the few remaining states will soon do the same; it is doubtful if the tide can be stemmed. Perhaps the best thing that can be done is to adjust matters to fit the inevitable. The best course for physicians specializing more or less in ophthalmology and living in large or small cities, to pursue, is, to equip themselves, to do the most superior and advanced refraction work possible, and to impress upon the public the advisability of consulting medical men for such work. They should also exert themselves to see that the optometry laws are obeyed, that optometrists are properly educated, that they absolutely abstain from the practice of medicine (except so far as fitting glasses is concerned) and that only those passing the legal requirements shall be allowed to advise as to what character of glasses shall be worn. The legally qualified optometrist will also do well to see that the laws are accurately carried out, and that he literally limits his work so that it is in accordance with the reading and meaning of the law. It is possible that by a mutual support and observance of the optometry laws as passed in the various

states, and by a resignation to inevitable conditions, on the part of the oculist, and a determination to keep within proper limits, on the part of the optician, the long and acrimonious discussion between the two may cease, a better understanding may be produced, and a much-to-be-desired peace may be established between the two belligerent factions.

Perhaps no one has written so fairly and comprehensively on the subject of "Oculists and Opticians," as Edward Jackson of Denver, and I have therefore with his consent, copied completely his pamphlet on this subject, that was recently written for the Conservation of Vision Committee of the American Medical Association.

"The use of some kind of a lens as an aid to defective or failing sight dates from the earliest days of civilization. In the ruins of Ninevah has been found a portion of a convex lens, such as might be used by a person who had passed middle life either to read with, or to see clearly objects near the eye. The Roman emperor Nero is said to have had an emerald through which he watched the combats of his gladiators; but this was probably a gem with a polished surface, which served as a mirror rather than as a lens. The Greeks were acquainted with the use of a convex lens as a burning glass or as a magnifier. But the common use of spectacles, and other optical instruments to assist the sight, began in Europe near the close of the thirteenth century, with the making of convex lenses to be used as an aid for the old.

"This invention has been ascribed to Roger Bacon, who gave the earliest account of the usefulness of lenses for this purpose. Alexander de Spina is said to have made spectacles, and to have taught others how to make them. But he did so after hearing of their invention by some one else, who kept the process of their manufacture secret. There is some evidence that they may have been known earlier than this in China. Certain it is that about this time spectacles came into use, and attracted general attention in several European countries; and from this date they began to be shown in paintings, tapestries, and other artistic representations.

"Their usefulness having been demonstrated, the demand for them developed trained artisans, who combined, in high degree, scientific knowledge with mechanical skill. The guilds of spectacle makers received recognition by royalty in France and England in the fifteenth and sixteenth centuries. Spinoza, the Dutch philosopher, made his living for some years by grinding lenses; and some specimens of his handiwork were among the most valuable of his effects left at his death. The scientific optician, if truly worthy

of the name, has a long lineage of learned and skilful workers, to whom he may trace the knowledge and skill that he has mastered and employs.

DEFINITIONS OF SOME IMPORTANT TERMS.

"In discussing this subject we shall have to make frequent use of the words 'physicians,' 'oculist' and 'optician.' Let us see what they mean.

"The word physician was originally used to designate either the man who applied physics to the restoring and preserving of health, or the one who applied the science of physics in other directions, or studied it rather as an abstract science. For the latter the word physicist has come into use; while the word physician indicates one whose applications of physics, chemistry, physiology and other sciences are to the securing of the health of the body. Optics is a branch of physics studied and applied in many ways by the physicist, but not much used by the physician until the last half of the nineteenth century.

"The word oculist is derived from the Latin word *oculus* (eye). The longer word ophthalmologist, derived from the Greek *ophthalmos* (eye), has the same meaning, one who pays special attention to the eye, its variations and diseases.

"Optician comes from the Greek word *optic*, meaning science or knowledge of light; and indicates originally one who studied and applied the science of optics, and thus one who made or dealt in optical instruments. The term optometrist has been devised to indicate one who measures the eyes, being built up from the Greek word *opt* (eye), and *metron* (a measure).

"It might be said in a general way that there are here two classes of words, one to designate the man who studies the eye in all its relations; the other referring to him who studies only the relations of light to the eye, and the means of modifying their relations.

"About 1800 Dr. Thomas Young, who was both physician and physicist, published very important observations on the eye and light. But these received no general practical application, until about 1850, Helmholtz, a physicist and physiologist, invented the ophthalmoscope, which enables us to look into the living eye. This invention caused a great increase of interest in, and knowledge of the diseases of the eye on the part of physicians.

"Shortly after this, Donders, a physician and physiologist, began to study and point out the influence of the defects of optical adjustments of the eye on health. Donders, and other physicians who followed him, finding that not only diseases of the eyes but

also such general conditions as headache, nervousness, indigestion, and many others might arise from eye-strain, through inaccurate optical adjustments of the eyes, devoted a great deal of time to the study of these defects of vision; and the recognition of their importance rapidly extended. Most rapidly did their recognition extend in America, where all branches of science are valued and pursued chiefly for their practical application to human needs. As a result, we know today far more about the eye and its troubles than has ever been known before.

"Glasses first were used to relieve poor vision that was plainly evident, like short-sight (myopia). Later, they were used to correct less obvious and more minute faults that were often unsuspected but that caused pain, inflammation, or other symptoms. This latter use presents problems such as the physician is accustomed to deal with, in the diagnosis and treatment of disease, and requires quite as much skill and experience.

"Of course the older use of lenses to correct short-sight and old-sight still continues; and is more generally resorted to as people come to value more highly distinctness of sight; and as a larger number come to use their eyes for reading, sewing, etc., and live to the age when these can be done only with the help of glasses. All such glasses, in enormously increased number, have to be prepared for use; and generally with much greater accuracy now, and by more complex processes than formerly. This results in a great increase in the extent and importance of the work done both by oculists and opticians.

"The multiplication of optical instruments other than spectacles has also greatly increased the field of the optician. Telescopes, with their many applications to astronomical, nautical and engineering instruments, besides field and opera glasses; cameras in their myriad shapes and modifications; and projection apparatus, including stereopticon lanterns, cinematographs, flash lights and optical fittings for light houses, all require skilled labor in optics.

"But although all of these, in some way, are used to extend or supplement the powers of the eye, we are here chiefly concerned with the preparation and application of spectacles and eye-glasses. Other optical instruments are adapted to special uses and furnished with appropriate adjustments so that any eye may use them. Spectacles and eye-glasses are adjusted in each case to the needs of a particular pair of eyes; and become a part of the optical outfit of the wearer, necessary to his best vision with the least strain.

THE SERVICE TO BE RENDERED.

"The labor of affording the proper optical assistance for each pair of eyes naturally falls into two departments. First, finding out what the eyes need in the way of optical assistance; second, supplying the glasses demanded in the shape that will be most efficient and satisfactory. The first is a part of the work of the oculist; the second is the work of the optician.

"Both must be familiar with the general principles of optical science. But to such knowledge as they have in common, the one must add a knowledge of health and disease, gained in the medical school; and the other must add a mechanical skill and expertness with the material of which lenses, prisms and mountings are made.

"Our civilization walks and works by sight. Only when we consider how many opportunities for labor are closed to the blind, or by what an heroic struggle a blind man competes in the ordinary occupations of life, do we realize the importance of this fact. Think of the occupations that now engage the labor of great numbers in every civilized community; the factories where delicate machinery is used or made, where fabrics are woven, or countless other articles of commerce are produced. Consider the influence of the sewing machine, or the typewriter, increasing enormously the number of stitches taken or words written, each stitch or word to be watched by the eyes. A prodigious increase in printed matter has occurred in the last fifty years. The old books remain to be read, while editions of new books run into the thousands, and the daily paper contains as much reading matter as a good sized book. General education rests wholly on sight, and the general test of the advance of a people in civilization is the disappearance of illiteracy.

"If we think still more closely about the matter, we perceive that most of the new occupations make demands on the eye, different in kind from what was demanded by the older occupations of hunting, tending flocks, cultivating the soil, or navigating the sea. The new forms of work require the seeing of near objects, to an extent to which the eye has had no time to adapt itself. Some nations may be growing near-sighted; but in such a rapid unnatural way that almost all near-sighted eyes are diseased. The great majority of eyes still have to do their near tasks, struggling under the handicap of far-sightedness. With great numbers of people using their eyes far more than they ever did before, and using them for harder tasks done under conditions for which their eyes are very imperfectly adapted, it is no wonder that there has

sprung up a class of physicians who devote the greater part or the whole of their time to the care of the eyes.

THE WORK OF THE OCULIST.

"It is the work of the oculist to study the conditions present in the eye, and to give advice or prescribe assistance, care or treatment; or to do the operations necessary to restore or preserve the health of the eye. To do his work he must know about the structure of the eye, and the actions of all its different parts, the conditions under which it can work, the defects that may exist in eyes and the injuries they may suffer from light, heat, chemical substances, blows, lacerations, foreign bodies or disease. Since the eyes are a part of the body such knowledge must include a knowledge of the structure and physiology of the body, its methods of repair and the dependence of one part on another; and since the eye is an optical instrument, the oculist must understand the relations of the eye to the light it uses.

"The oculist may be called on to remove an eye that threatens to destroy the sight of its fellow eye or which may contain a cancer which must be removed in order to save the life of the patient. Or he may have to remove a cataract from an eye to restore its sight. Such operations demand the careful, scientific training and mechanical skill of an educated surgeon. He may be required to recognize that the condition seen in the eye is due to some general disease, like tuberculosis; and he must be trained to look for other signs of this disease, and to advise or carry out its general treatment. He may need to prescribe a certain diet for one condition, or to prohibit the use of tobacco or alcoholic liquors to check the course of another. In many cases, the condition to be dealt with in the eye cannot be understood or cured without understanding and treating some condition of general health on which it depends. All this calls for the knowledge and training of the physician.

"The oculist may be asked to decide whether the eye presents any symptoms that may throw light on some impairment of general health that otherwise remains obscure. Is there some disease of the brain, which can be recognized by changes in the optic nerve, or in the field of vision? Is there serious disease of the blood vessels of the body, which is usually first shown in the blood vessels of the retina at the back of the eye? To understand the significance of what he sees in the eye the oculist must have a general medical education.

"On the other hand, the oculist is expected to tell if poor vision is due to some general or ocular disease; or whether it is due to

some defect of focus of the eye. He must understand the methods of recognizing and measuring such faults of focus, the effects that they cause; and the extent to which the symptoms complained of by the patient, or discovered by examining the eye, may arise from the fault of focus in the eye, and to what extent they may be due to disease or injury.

"It has sometimes been suggested that oculists should confine their labors to the surgery and medical treatment of the eye; leaving the measurement and correction of faults of focus to the opticians, who once did all that kind of work that was done. This was left to opticians, when it was not known that faults in the focus of the eye (errors of refraction) caused disturbances of health; and when comparatively little attention was given to diseases of the eye by anybody. At that time persons with poor sight sought the help of glasses simply to enable them to see better. They tried on glasses to see if they improved the sight, and chose those that seemed to make the sight best. The optician stood by to explain how the eyes should be tried; to warn against getting glasses that would be too strong, and to prepare and adjust such as were finally chosen, as giving the best vision.

"When, however, it was found that serious conditions such as inflammation of the eyes and lids, squint (cross eye), cataract, glaucoma, atrophies of the choroid, or detachment of the retina resulted from errors of refraction; and that such faults of focus produced headache, dizziness, nervous dyspepsia, etc., it was natural that those who studied and treated these ocular diseases and these general diseases, should pay attention to errors of refraction in the eye.

"The patient who comes to the oculist for poor vision may need glasses to correct his fault of focus, or he may be suffering from a condition of the retina due to disease of his kidneys, his arteries or his brain. Headache may arise from eye-strain, or it may arise from disease in the nose, brain disease or fever. Evidently, one who is informed about and able to recognize all of these conditions is a safer and more satisfactory person to consult about poor vision or headache, than one who is only trained to fit glasses. The work of finding out if relief can be given by correcting a fault in the focus of the eye cannot be separated from the work of measuring such faults of focus. Hence the work of measuring the focus of the eye, the decision as to what glasses should be worn, and the judgment as to whether it is worth while to wear them, or how

much of the time it is worth while to wear them, belong to the oculist.

"To reach correct conclusions as to these points various methods of examination are to be used, and different possible causes of poor vision or other symptoms suffered from have to be considered.

"There are many ways by which the refraction of the eye can be measured. Among the more important are:

"1. Looking into the eye with the ophthalmoscope, and noticing with what lens the back of the eye is seen most clearly.

"2. Finding where the light coming out of the eye forms an image of the retina, with or without the aid of glasses; called the shadow-test.

"3. Determining the curves of the front surface of the eye, by the reflections from them, measured by a special instrument called the ophthalmometer.

"4. Testing the acuteness of vision with test letters, and the changes in vision caused by placing different glasses before the eye.

"5. Testing the direction in which parallel lines can be seen most clearly; and finding the nearest point to the eye at which fine print can be seen distinctly.

"Other methods are often used by individual oculists. Certainty is only obtained by using two or more ways of measuring the focus of each eye.

"Often the glass which is nearly right gives no relief. To make sure of the glass that will be exactly right or best for each particular eye is a difficult and tedious undertaking. No one familiar with it will wonder that the effort is sometimes given up, and something that it is hoped "will answer" is prescribed instead. Unfortunately, it often does not answer, and the process of measurement has to be repeated.

"He who thinks it is easy and simple to measure the eyes for glasses knows little about it. One who is comfortable with glasses quickly and easily chosen is unusually lucky, or has not seriously felt the need for such help, has eyes that are insensitive, or is not using them to near the limit of their capacity.

"There are some persons who do not use their eyes very hard or very much of the time for work that taxes them, who are able to get along with imperfect sight, or with glasses that give only imperfect help. But with an increasing number who spend their working days at sewing, stenography, book-keeping, reading, type-setting, and the finer mechanical employments, a larger and larger part of the community needs and appreciates the accurate correc-

tion of every error of ocular focus; and the removal of every condition of health or surroundings that injuriously influences the eyes. Because this is so, the work of the oculist goes on increasing.

THE WORK OF THE OPTICIAN.

"Every perfect lens must be made of glass that is quite transparent, and free from flaws and irregularities in its action on light. It must have perfect curves, exactly adapted to its action on light, and to the eye it is designed to assist; and its surfaces must be perfectly polished. Then, to serve its purpose in assisting the eye to focus light properly, it must be accurately placed before the eye, in a frame that will keep it in the right position. All this is expected of the skilled optician.

"The making of optical glass in large quantities and according to fixed formulas, supplies glass having a practically constant effect on light passing through it. The making of the steel tools with which the surfaces are ground is in the hands of a comparatively few expert mechanics who are able to give very accurate surfaces to them. This accuracy in the preparations made for lens grinding renders unnecessary the frequent calculation of what curve on the tool will be needed to give the desired lens effect with a certain sample of glass, which the early opticians had to be prepared for; and to a large extent the process of lens grinding can be carried on by machinery, attended by comparatively unskilled workers.

"But any piece of glass is liable to flaws, some of which cannot be detected until the lens surfaces have been finished. The tools, however, accurately made to start with, tend to change their shape, and become inaccurate with use. Defective lenses from these causes must be continually guarded against.

"With cylindrical lenses [which have come into general use entirely within the last fifty years, since oculists began to pay attention to defects of ocular focus] it is necessary not only to get a lens of just the right strength; but it must also have its axis turned in the right direction. With the axis turned 90 degrees from the proper direction, the fault of focus would be doubled instead of being corrected. With the axis 45 degrees from the proper direction no benefit, but only harm would result. Even with the axis 5 or 10 degrees from its right direction, a cylindrical lens of the right strength may be of little help; and quite unsatisfactory.

"Prisms employed to help the eyes must also have their bases turned in the right direction or they will be useless or worse than useless. All lenses used before the eyes must have their optical

centers (the thickest point or the thinnest point of the lens) properly placed with reference to the lines of sight of the two eyes. Otherwise they give the effects of unneeded or harmful prisms disturbing the actions of the eye muscles.

"Finally, no two faces are alike. In order that the frames by which the glasses are kept in position before the eye shall retain them in the proper position, these frames must be adapted to the face with care and accuracy. Skill in accurately adjusting the frames so that they will keep the glasses just where they should be kept, and at the proper angle, requires an intelligent grasp of the mechanical principles involved, and a large experience. It is a matter in which opticians differ greatly in expertness; and one that is often neglected by those who regard themselves as able to do the work of both oculist and optician. Often a pair of lenses that has been quite unsatisfactory because not properly placed before the eyes, will become comfortable to wear, and satisfactory in effect, when, by a slight change, the frames have been properly placed.

"Beside the preparation of the proper lenses, and their accurate placing before the eye, there are other important matters in which the knowledge and skill of the optician can render valuable assistance to those who seek his services. The frames should not only hold the lenses in the right position, they should bear on the face so as to cause no discomfort. The annoyance from an uncomfortable frame may quite neutralize the comfort obtained from properly chosen lenses. The cutting down of unnecessary weight by making the glasses as thin as practicable is an evidence of expertness on the part of the optician, which may add much to the comfort of his patrons, particularly if the glasses have to be worn constantly.

TRADE OR PROFESSION.

"A distinction that usually exists between the oculist and the optician is that the one practices a profession, and the other follows a trade. This difference is not rigidly connected with the character of the services they render in the community, but it commonly exists. He who practices a profession sells his time and the effort spent in helping his patient or client for a fee charged for his opinion or advice. He who carries on a trade sells a material object to which his time, effort and skill has given increased value.

"It is the duty of the professional man to give advice solely for the patient's good. In trade, the legal principle *caveat emptor*—'Let the buyer look out for his own interests,' is recognized. In

the long run the most successful tradesman is the one who gives a square deal, and who looks out for the interests of his customers. Still, between a profession and a trade there remains a real difference.

"Most people do not wish to begin wearing glasses unless there is good reason for it, or to wear them more constantly than is necessary. So they naturally prefer the opinion of one who has no glasses for sale, who will give them a purely professional opinion, and who would get the same fee, whether he advises one way or the other, to the advice of one whose only chance of profit depends on selling a pair of glasses.

"Well-meaning persons have thought to obliterate this distinction and to create a profession, chiefly by the passage of 'optometry laws,' and the organization of schools to teach optics. It has been supposed, by those who know little of disease, or the effects of faults of ocular focus on the general health, that such schools, requiring two years of study or less, could teach men to treat diseases of the eye, and to prescribe and fit glasses.

"Very plausible arguments may be made in favor of laws to protect the public from unqualified imposters who pretend to understand something about diseases of the eye, and on the way that glasses may help to keep or regain health. But, unfortunately, many of the optometry laws so far passed have tended to give these imposters protection, and a legal status that aids them to impose on the public; while the tendency to create a profession has been very slight.

"Such attempts are based on the false assumption that the oculist who has spent four years in the study of medicine, and two or more years in the special study of the eye and its diseases, knows more than is necessary to qualify him for his special work. The relations of the teeth to other parts of the body is a comparatively simple matter; the eyes and their body relations are extremely complex. Yet dental schools require a three years' course, during which each student is expected to dissect and study the entire human body.

"Oculists have no desire to discourage the careful study of optics, or the cherishing of professional ideals. But, knowing the real facts of the case, they must protest against a pseudo-profession, that can only confuse and harm the public; and a pretended preparation for service where real preparation is impossible.

"Particularly misleading are the titles Doctor of Optometry, Doctor of Optics, etc., which are claimed by some of these optical imposters. These titles may be obtained from proprietary diploma

mills, without competent faculties, after a six-weeks' or six-months' course, sometimes taken entirely by correspondence. They are used to give the false impression that the user knows something of medicine, and is competent to cure disease. The real Doctor of Medicine studies four or more years after a thorough high school and perhaps a college course. The Doctor of Philosophy or Science has six or more years of college work. A few universities now give diplomas for special study in ophthalmology, after a full course in medicine. But any title of 'doctor' is to be looked on with great suspicion, unless it is known to have come from an established institution that requires four or more years of study after proper preparation. Especially is a title sure to be used for a fraudulent purpose when it is accompanied by a list of diseases for which a cure is promised by glasses, or 'exercises.'

GETTING GLASSES.

"The optician without any knowledge of medicine is often asked to give advice as to whether glasses will relieve symptoms, like headache, or inflammations of the eyes, and what glasses will do it; just as the pharmacist is continually asked what drugs will relieve headache, or inflammations of the eyes or other parts. This is partly because people used to go to the optician for glasses, and they do not know anyone better to go to. The conscientious optician, if he knows of an oculist who is accessible may refer such people to him, stating his readiness to make any glasses that are needed. But if no one competent to prescribe glasses can be reached, the old way of buying such glasses as can be chosen with the optician's help is often tried.

"On the other hand, there are places in which a well-trained oculist is engaged in practice; but in which there is no optician who can do an optician's proper work in a satisfactory manner. Under such circumstances the oculist is compelled, when he prescribes glasses, to furnish them also, and to fit them as well as he can to the patient's face. He cannot fully replace the skilled optician. For grinding of surfaces he must depend on wholesale firms at a distance; and his success in the fitting of frames will often be attained by confining his efforts to one style of frame, such as spectacles, which can be made to conform to certain measurements of the face.

"Wherever it is possible, the community is best served by the trained oculist and the trained optician, working in conjunction, each in his proper sphere. This is the arrangement that is gradually developing. But custom, established before the relation of

the eyes to the general health was known, still has great influence. People who think automobiles a great advance over ox-carts, still think because their grandfathers chose glasses with the help of an optician, that this is the best way to get spectacles. It is only slowly that established custom and tradition give way to improved methods and new ways of thinking; and many will not look ahead to provide for the future health of their eyes, however important this may be to them.

"In trying to find a competent oculist to attend to the eyes the best plan is to enquire of one's family physician, and to be guided by his advice. If you cannot trust his advice in this matter, you are very unfortunate in the selection of such an advisor.

"There is no trouble in finding the quack. He is essentially much the same in the field of eye diseases with his promise of curing all sorts of ailments with glasses, as in the fields of cancer, consumption or kidney disease. But his plan of campaign is somewhat different. Sometimes he is or claims to be a doctor of medicine, seeking to spread the idea that by "study in Europe" or in some large distant city, he has had unusual opportunities to learn things that other doctors do not know. He depends on advertising to spread the impression that he offers the people a rare opportunity to be cured, of curable or incurable diseases, and he travels from place to place.

"In a scattered community a competent oculist may serve the public by having offices in more than one town, where on certain days he can be consulted. But he depends for practice on the reputation established by his work, and the respect he has gained from other doctors and acquaintances, not on newspaper notices and published certificates. The quack oculist cannot wait for such a slow growth of business. He must force his claims on the public as rapidly as possible; and as he becomes known in the community, by his failures and his falsehoods, he must go somewhere else. Comparatively few that have had any education in general medicine and diseases of the eye have gone into this kind of quackery. Much the greater number of the quacks come in the guise of Optometrists, Doctors of Optics, etc.

"The relief of diseases of the eye, and of symptoms of disturbed nerve action, or general impairment of health, by relief from eye-strain is a new field in medicine, and especially attractive to adventurers. Its attractions have been emphasized by those who offer through 'schools of optometry' the little instruction that they claim can bring success in this new field; and by those ready to sell the

would-be optometrist his test-lenses, test-cards, ophthalmoscope, and other apparatus. The optical schools and wholesale dealers interested in exploiting them, have invited all who seek short cuts in business to take a course of one week to one year, buy an outfit costing from fifty dollars up; and become rich by telling the people what kind of glasses they ought to wear and by selling them these glasses at the highest prices their plausible talk can command.

"The culmination of this movement is the traveling optician-oculist, who goes from place to place heralded by newspaper puffs and advertising, impressing the simple with his claims to greatness, supplying glasses at his own price; and moving on to new fields when the community begins to see the hollowness of his pretensions. The quack in his line, as in others, seeks to get money by working on the hopes and fears of his victims, and to get away with it before they turn against him. It may be pointed out that these pretenders commonly know as little about the work of the optician as they do about that of the oculist.

"Health, the highest capacity to achieve and enjoy, is a precious thing. As its value is better understood more effort will be made to attain and preserve it. With reference to the eyes, fewer people will abuse or neglect them; or take chances of their injury by quacks. More will seek expert assistance to find out what is best for their sight, what can be done to strengthen the eyes in any way, or to discover through the eyes, what may be needed to promote the general health.

"The traditional self-choosing of glasses, and the claims of the half-educated pseudo-professional man will be cast aside; and more dependence placed on the advice of the oculist, trained to consider the eye from all points of view, in all its relations; and the skilled optician who does his own work so well that he has neither time nor inclination to offer inferior service in a different field."

The Optometry laws of the different states will now be given.

NEW MEXICO OPTOMETRY LAW

1905.

Be it enacted by the Legislative Assembly of the Territory of New Mexico:

Section 1. The practice of optometry is defined as follows, namely: The employment of subjective and objective mechanical means to determine the accommodative and refractive states of the eye and the scope of its functions in general.

Sec. 2. Same as Arizona Optometry Law numbered Sec. 2.

Sec. 3. There is hereby created a board, whose duty it shall be to carry out the purposes and enforce the provisions of this act, and shall be styled the New Mexico Territory Board of Examiners in Optometry.

Said board shall be appointed by the governor as soon as practicable after the passage of this act, and shall consist of three persons, two engaged in the actual practice of optometry, and one physician oculist, residing in the Territory of New Mexico. Each member of said board shall hold office for a term of three years, and until his successor is appointed. Appointments to fill vacancies caused by death, resignation or removal, shall be made for the residue of such term by the governor. The members of said board, before entering upon their duties, shall respectively take and subscribe to the oath required to be taken by other officers, and filed with the clerk of the county in which said member resides, and said board shall have a common seal.

Secs. 4, 5, 6, 7, 8, 9, 10, same as Secs. 4, 5, 6, 7, 8, 9 and 10 of the Arizona Optometry Law respectively.

Sec. 11 same as Sec. 11 Arizona Optometry Law, excepting the fare per mileage is three cents instead of four cents as in Arizona Optometry Law.

Sec. 12 same as Sec. 12 of Arizona Optometry Law.

Sec. 13 same as Sec. 13 of Arizona Optometry Law, excepting the restriction for habitual drunkenness is six months immediately before a charge to be made, instead of two months as in Arizona.

Secs. 14 and 15, same as Arizona Optometry Law.

Sec. 16. Nothing in this act shall be construed to apply to physicians and surgeons authorized to practice under the laws of the Territory of New Mexico, nor to persons who sell spectacles or eyeglasses in the ordinary course of trade, and do not attempt to employ subjective and objective mechanical means to determine the accommodative and refractive states of the eye.

Sec. 17 Same as Sec. 17 of the Arizona Optometry Law.

NORTH DAKOTA OPTOMETRY LAW

1905.

Sec. 324. *Defined*—The practice of optometry is defined as follows, namely: The employment of subjective and objective mechanical means to determine the accommodative and refractive states of the eye and scope of its functions in general, and the applying of lenses as corrective.

Sec. 325. *Unlawful to Practice Without Certificate*—It shall be unlawful for any person to practice optometry in the State of North Dakota unless he shall first have obtained a certificate of registration.

Sec. 326. *Board Created*—There is hereby created a board, whose duty it shall be to carry out the purpose and enforce the provisions of this article, and shall be styled "North Dakota State Board of Examiners in Optometry." Said board shall be appointed by the governor and shall consist of five resident opticians who are members of the North Dakota Optical Association, engaged in the actual practice of optometry. Each member of said board shall hold office for a term of three years, and until his successor is appointed. Appointments to fill vacancies caused by death, resignation or removal shall be made for the residue of such term by the governor. The members of said board, before entering upon their duties shall respectively take and subscribe to the oath required to be taken by other state officers, and said board shall have a common seal.

Sec. 327. *Governor to Appoint Officers—Meetings*—The governor shall appoint one of the members of said board president, and one member secretary, who severally shall have the power during their term of office to administer oaths and take affidavits, certifying thereto under their hand and the seal of the board. Said board shall meet at least once in each year at a place designated by the board, and in addition thereto whenever and wherever the president and secretary thereof shall call a meeting. A majority of said board shall at all times constitute a quorum. The secretary of said board shall keep a full record of the proceedings of said board, which records shall at all reasonable times be open to public inspection. Such records shall also contain a registry list of all persons registered by said board, together with renewals and revocations of licenses, which record shall constitute the official register of all persons licensed to practice optometry in this state.

Sec. 328. *Examinations*—Every person before beginning to practice optometry in this state shall pass an examination before said board of examiners. Such person shall make written application to said board of examiners and such application shall be accompanied by the affidavit of two freeholders of this state, to the effect that the person is of good moral character and a resident of this state. Such person shall also furnish to the board satisfactory proof that he is a graduate of some school of optometry to be approved by the board, or that he has practiced optometry for two full years as a student practitioner under the supervision of a regular optician or has practiced as a regular optician for two full years outside this state. Such examination shall be confined to such knowledge as is essential to the practice of optometry. Any person having signified to said board his desire to be examined by them shall appear before them at such time and place as they may designate, and before beginning such examination shall pay to said secretary for use of said board the sum of ten dollars and if he shall successfully pass such examination, shall pay to said secretary, for the use of said board, a further sum of five dollars on the issuance to him of a certificate. All persons successfully passing such examination shall be registered in the board register, which shall be kept by said secretary as licensed to practice optometry, and shall receive a certificate of such registration, to be signed by the president and secretary of said board.

Sec. 329. *Fees*—Every person who is residing and engaged in the practice of optometry in the state of North Dakota at the time of the taking effect of this article, shall within six months thereafter file an affidavit in proof thereof with said board, who shall make and keep record of such person, and shall for the consideration of the sum of three dollars, issue to him a certificate of registration.

Sec. 330. *Who Exempt from Provisions of Section 328*—All persons entitled to a certificate of registration under the full provisions of Section 329 shall be exempt from the provisions of Section 328.

Sec. 331. *Fee for Filing Certificate*—Such board shall be entitled to a fee of one dollar for the reissue of any certificate.

Sec. 332. *Penalty*—Any persons entitled to a certificate, as provided for in Section 329, who shall not within six months after the passage

thereof make written application to the board of examiners for certificate of registration, accompanied by a written statement, signed by him, and duly verified before an officer authorized to administer oaths within this state, fully setting forth the grounds upon which he claims such certificate, shall be deemed to have waived his right to a certificate under the provisions of said section. Any failure, neglect or refusal on the part of any person holding such certificate to file the same for record as hereinbefore provided, for six months after the issuance thereof, shall forfeit the same.

Sec. 333. *Certificate to be Displayed*—Every person to whom a certificate of examination or registration is granted shall display the same in a conspicuous part of his office wherein the practice of optometry is conducted.

Sec. 334. *Compensation of Board*—Out of the funds coming into the possession of said board, each member thereof may receive as compensation, the sum of five dollars for each day actually engaged in the duties of his office, and mileage at three cents per mile for all distance necessarily traveled in going to and coming from the meetings of said board. Said expenses shall be paid from the fees and assessments received by the board under the provisions of this article, and no part of the salary or other expenses of the board shall ever be paid out of the state treasury. All moneys received in excess of said per diem allowance and mileage as above provided for, shall be held by the secretary as a special fund for meeting expenses of said board and carrying out the provisions of this article, and he shall give such bonds as the board shall from time to time direct; and the said board shall make an annual report of its proceedings to the governor on the first Monday of December of each year, which report shall contain an account of all moneys received and disbursed by them pursuant to this article. All surplus moneys shall go to the state school fund.

Sec. 335. *Annual License Fee*—Every registered optician shall in every year after 1903 pay to said board of examiners the sum of two dollars as a license fee for each year. Such payment shall be made prior to the first day of April in each and every year, and in case of default in such payment by any person, his certificate may be revoked by the board of examiners upon twenty days' notice of the time and place of considering such revocation. But no license shall be revoked for such non-payment if the person so notified shall pay before or at such time of consideration his fee and such penalty as may be imposed by said board; provided that said board may impose a penalty of five dollars and no more on any person so notified, as a condition of allowing his license to stand; provided further, that said board of examiners may collect any such dues by suit.

Sec. 336. *Certificate Revoked—When*—Said board shall have power and must revoke any certificate of registration granted by it under this article, for conviction of crime, habitual drunkenness, or the excessive use of intoxicating liquors or narcotic drugs for six months immediately before a charge is made, contagious or infectious disease, gross incompetency or for advertising himself as an eye specialist or doctor, or member of this board, or for designating himself in any manner as other than an optician or optometrist, skilled in the art of optometry;

provided that before any certificate shall be so revoked the holder thereof shall have notice in writing from the secretary of the charge or charges against him, and at a day specified in said notice, at least five days after the service thereof, be given a public hearing, and have opportunity to produce testimony in his behalf and to confront the witnesses against him. Any person whose certificate has been so revoked may after the expiration of sixty days apply to have the same regranted, and the same shall be regranted him upon a satisfactory showing that the disqualification has ceased.

Sec. 337. *Penalty*—Any person who shall violate any of the provisions of this article shall be deemed guilty of a misdemeanor, and upon conviction may be fined not less than twenty dollars nor more than one hundred dollars, or be confined not less than one month nor more than three months in the county jail. And all fines thus received shall be paid into the common school fund of the county in which such conviction takes place.

Sec. 338. *Justice of Peace to Have Jurisdiction*—Justices of the Peace shall have jurisdiction of violations of this article. It shall be the duty of the respective state's attorneys to prosecute all violations of this article.

Sec. 339. *Who Exempt*—Nothing in this article shall be construed so as to require physicians and surgeons authorized to practice under the laws of the state of North Dakota to be registered under the provisions of this article, but such persons shall be deemed to be regular licensed to practice optometry by virtue of their license to practice medicine and surgery; nor to apply to persons who sell spectacles or eyeglasses or any other article of merchandise without attempting to practice optometry as in this article defined, nor to student practitioners under the supervision of registered opticians.

ARIZONA OPTOMETRY LAW.

1907.

Be it enacted by the Legislative Assembly of the Territory of Arizona:

Section 1. The practice of optometry is defined as follows, namely: The employment of subjective and objective means to determine the accommodative and refractive states of the eye and the scope of its functions in general.

Sec. 2. It shall be unlawful for any person to practice optometry in the Territory of Arizona unless he or she shall first have obtained a certificate of registration and filed the same, or a certified copy thereof, with the clerk of the county of his or her residence all as hereinafter provided.

Sec. 3. There is hereby created a board, whose duty it shall be to carry out the purposes and enforce the provisions of this act, and shall be styled the Arizona Territory Board of Examiners in Optometry. Said board shall be appointed by the governor as soon as practicable after the passage of this act, and shall consist of three persons engaged in the actual practice of optometry, and residing in the Territory of Arizona. Each member of said board shall hold office for a term of four years, and until his successor is appointed. Appointments to fill vacancies caused by death, resignation or removal, shall be made for the residue of such term by the governor. The members of said board,

before entering upon their duties, shall respectively take and subscribe to the oath required to be taken by other officers, and filed with the clerk of the county in which said member resides, and said board shall have a common seal.

Sec. 4. Said board shall choose at its first regular meeting, and annually thereafter, one of its members president, and one secretary thereof, who severally shall have the power during their term of office to administer oaths and take affidavits, certifying thereto under their hand and the seal of the board. Said board shall meet at least once in each year at the territorial capitol, and in addition thereto, whenever and wherever the president and secretary thereof shall call a meeting; a majority of said board shall at all times constitute a quorum. The secretary of said board shall keep a full record of the proceedings of said board, which records shall at all reasonable times be open to public inspection.

Sec. 5. Every person before beginning to practice optometry in this territory, after the passage of this act, shall pass an examination before said board of examiners. Such examiners shall be confined to such knowledge as is essential to the practice of optometry. Any person having signified to said board his or her desire to be examined by them shall appear before them at such time and place as the board may designate, and before beginning such examination shall pay to the secretary of said board, for the use of said board, the sum of ten dollars, and if he or she shall successfully pass such examination, shall pay to said secretary, for the use of said board, a further sum of five dollars on the issuance to him or her of a certificate. All persons successfully passing such examination shall be registered in the board register, which shall be kept by said secretary, as licensed to practice optometry, and shall also receive a certificate of such registration, to be signed by the president and secretary of said board, which shall be filed as hereinbefore provided.

Sec. . Every person who is actually engaged in the practice of optometry in the Territory of Arizona, at the time of the passage of this act, shall, within six months thereafter, file an affidavit in proof thereof with said board, who shall make and keep record of such person, and shall, in the consideration of the sum of five dollars, issue to him a certificate of registration.

Sec. 7. All persons entitled to a certificate of registration under the full provisions of Section 6 shall be exempt from the provisions of Section 5 of this act.

Sec. 8. Recipients of said certificate of registration shall present the same for record to the clerk of the county in which they reside, and shall pay a fee of fifty cents to the clerk for recording same. Said clerk shall record said certificate in a book to be provided by him for that purpose. Any person so licensed removing his or her residence from one county to another in this territory shall, before engaging in the practice of optometry in such other county, obtain from the clerk of the county in which said certificate of registration is recorded, a certified copy of such record, or else obtain a new certificate of registration from the board of examiners, and shall, before commencing to practice in such county, file the same for record with the clerk of the county to

which he removes, and pay the clerk thereof for recording same, a fee of fifty cents. Any failure, neglect or refusal on the part of the person holding such certificate or copy of record to file the same for record, as hereinbefore provided, for six months after the issuance thereof, shall forfeit the same. Such board shall be entitled to a fee of one dollar for the reissue of any certificate, and the clerk of any county shall be entitled to a fee of one dollar for making and certifying a copy of the record of any such certificate.

Sec. 9. Any person entitled to a certificate, as provided for in Section 6 of this act, who shall not within six months after the passage of this act make written application to the board of examiners for a certificate of registration, accompanied by a written statement, signed by him, and duly verified before an officer authorized to administer oaths within this territory, fully setting forth the grounds upon which he claims such certificate, shall be deemed to have waived his or her rights to a certificate, under the provisions or refusal on the part of any person holding such certificate under the provisions of such section. Any failure, neglect or refusal on the part of any person holding such certificate to file the same for record, as hereinbefore provided, for six months after the issuance thereof, shall forfeit the same.

Sec. 10. Every person to whom a certificate of examination or registration is granted shall display the same in a conspicuous part of his or her office wherein the practice of optometry is conducted.

Sec. 11. Out of the funds coming into the possession of said board, each member thereof may receive, as compensation, the sum of five dollars for each day actually engaged in the duties of his office, and mileage at four cents per mile for all distance necessarily traveled in going to and from the meetings of the board. Said expenses shall be paid from the fees and assessments received by the board under the provisions of this act, and no part of the salary or other expenses of the board shall ever be paid out of the territorial treasury. All moneys received in excess of said per diem allowance and mileage, as above provided for, shall be held by the secretary as a special fund for meeting expenses of said board and carrying out the provisions of this act, and he shall give such bond as the board shall from time to time direct, and the said board shall make an annual report of its proceedings to the governor on the first Monday in January of each year, which report shall contain an account of all moneys received and disbursed by them pursuant to this act.

Sec. 12. Every registered optometrist who desires to continue the practice of optometry in this territory shall annually, on such date as the board of examiners may determine, pay to the secretary of said board a registration fee to be fixed by the board, but which shall in no case exceed the sum of two dollars per annum, for which he or she will receive a renewal of said registration; and in default of such payment, by any person, his or her certificate may be revoked by the board of examiners under twenty days' notice of the time and place of considering such revocation, but no certificate shall be revoked for such non-payment if the person so notified shall pay before or at such time of consideration his or her fee and such penalty as may be imposed by said board; provided, that said board may impose a penalty of five dol-

lars and no more on any one person so notified, as a condition of allowing such certificate to stand; provided, further, that said board of examiners may collect any such fees by suit.

Sec. 13. Said board shall have power to revoke any certificate of registration granted by it under this act, for conviction of crime, habitual drunkenness for two months immediately before a charge to be made, gross incompetency, or contagious or infectious disease; provided, that before any certificate shall be so revoked, the holder thereof shall have notice in writing of the charges specified, and a day set and named in said notice, at least five days after the service thereof, be given a public hearing, and have opportunity to produce testimony in his or her behalf and to confront opposing witnesses. Any person whose certificate has been so revoked may, after the expiration of ninety days, apply to have the same regranted; and the same shall be regranted, upon a satisfactory showing that the disqualification has ceased.

Sec. 14. Any person who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than twenty dollars nor more than one hundred dollars, or be confined not less than one month, or more than three months in the county jail, and in default of payment of said fine shall be imprisoned in the county jail at the rate of one day for every two dollars of the fine so imposed, and all fines thus received shall be paid into the common school fund of the county in which such conviction takes place.

Sec. 15. Justices of the Peace and the respective municipal courts shall have jurisdiction of violations of this act. It shall be the duty of the respective district attorneys to prosecute all violations of this act.

Sec. 16. Nothing in this act shall be construed to apply to physicians and surgeons authorized to practice under the laws of the Territory of Arizona.

Sec. 17. This act shall take effect and be in force from and after its passage.

IDAHO OPTOMETRY LAW.

1907.

Idaho Optometry Law is similar to the Florida Optometry Law. In Idaho the board, whose duty it is to carry out and enforce the provisions of this act, is composed of three opticians instead of five, as in Florida.

MONTANA OPTOMETRY LAW.

1907.

Be it enacted by the Legislative Aeesmbly of the State of Montana: Sections 1 and 2 similar to Arizona Optometry Law.

Sec. 3. There is hereby created a board whose duty it shall be to carry out the purposes and enforce the provisions of this act, and shall be styled the "Montana State Board of Examiners in Optometry." Said board shall be appointed by the governor as soon as practicable after the passage of this act, and shall consist of five resident opticians engaged in the actual practice of optometry. Each member of said board shall hold office for a term of three years, and until his successor is appointed. Appointments to fill vacancies, caused by death, resignation or removal, shall be made for the residue of such term by the governor.

The members of said board, before entering upon their duties, shall respectively take and subscribe to the oath required to be taken by other state officers, which shall be administered by the secretary of state and filed in his office; and said board shall have a common seal.

Sec. 4. Said board shall choose at its first regular meeting, and annually thereafter, one of its members president and one secretary thereof, who severally shall have the power during their term of office to administer oaths and take affidavits, certifying thereto under their hand and the seal of the board. Said board shall meet at least once in each year, at the state capitol, and in addition thereto, whenever and wherever the president and secretary thereof shall call a meeting; a majority of said board shall at all times constitute a quorum. The secretary of said board shall keep a full record of the proceedings of said board, which records shall at all reasonable times be open to public inspection.

Sec. 5 similar to Arizona Optometry Law.

Sec. 6. Every person who is engaged in the practice of optometry in the State of Montana at the time of the passage of this act shall, within three months thereafter, file an affidavit in proof thereof with said board, who shall make and keep record of such persons, and shall in the consideration of the sum of five dollars, issue to him a certificate of registration.

Secs. 7, 8, 9 and 10 similar to Arizona Optometry Law.

Sec. 11. Out of the funds coming into the possession of said board, each member thereof may receive as compensation the sum of five and no/100 (\$5.00) dollars for each day actually engaged in the duties of his office, and mileage at three cents per mile for all distance necessarily traveled in going to and coming from the meetings of said board. Said expenses shall be paid from the fees and assessments received by the board under the provisions of this act, and no part of the salary or other expenses of the board shall ever be paid out of the state treasury. All moneys received in excess of said per diem allowance and mileage, as above provided for, shall be held by the secretary as a special fund for meeting expenses of said board, and carrying out the provisions of this act, and he shall give such bonds as the board shall from time to time direct, and the said board shall make an annual report of its proceedings to the governor on the first Monday in January of each year, which report shall contain an account of all moneys received and disbursed by them pursuant to this act.

Sec. 12. Said board shall have the power to revoke any certificate of registration granted by it under this act for conviction of crime, habitual drunkenness for six months immediately before a charge to be made, gross incompetence, or contagious or infectious disease, or who publicly professes to cure disease; provided, that before any certificate shall be so revoked, the holder thereof shall have notice in writing of the charge or charges against him, and at a day specified in said notice, at least five days after the service thereof, be given hearing, and have opportunity to produce testimony in his behalf and to confront the witnesses against him. Any person whose certificate has been revoked may, after the expiration of ninety days, apply to have the same re-

granted, and the same shall be granted him, upon a satisfactory showing that the disqualification has ceased.

Sec. 13. Any person who shall violate any of the provisions of this act shall be decreed guilty of a misdemeanor, and upon conviction may be fined not less than twenty and no/100 (\$20.00) dollars, nor more than one hundred and no/100 (\$100.00) dollars, or to be confined not less than one month, nor more than three months in the county jail. And all fines thus received shall be paid into the common school fund of the county in which such conviction takes place.

Secs. 14, 15 and 16 same as Arizona Optometry Law—Sections 15, 16 and 17.

UTAH OPTOMETRY LAW.

1907.

Be it enacted by the Legislature of the State of Utah:

Section 1. It shall be unlawful for any person in the State of Utah to practice or attempt to practice optometry as hereinafter defined; or to advertise, or hold himself out as qualified to fit or adjust any lenses or lens in any manner or form as an aid or assistance to human eyesight, without first obtaining a certificate to practice optometry, as hereinafter provided.

Sec. 2. The practice of optometry is the use of any means, artificial or otherwise, except the administration or application of drugs, for ascertaining the refractive and optical condition of the human eye for the purpose of adjusting and fitting lenses thereto, or the fitting or adjusting of lenses thereto.

Sec. 3. There is hereby created a board, consisting of three persons, which shall be styled the Utah State Board of Examiners in Optometry, whose duty it shall be to carry out the purposes and enforce the provisions of this act. Said board shall be appointed by the governor for a term of two years, by and with the consent of the senate. Each member of the board shall be a resident of the State of Utah, and shall have been engaged in the actual practice of optometry in the state for at least five years prior to his appointment. All appointments to fill vacancies caused by death, resignation, or removal, shall be made by the governor. The members of said board, before entering upon their duties, shall respectively take and subscribe to the oath required to be taken by state officers, which shall be administered by the secretary of state, and filed in his office.

Sec. 4. Said board shall choose at its first meeting, and annually thereafter, one of its members as president, and one as secretary and treasurer thereof. Each member of the board shall have the power, during his term of office, to administer oaths and take affidavits, certifying thereto under its hand and the seal provided and kept by the board. Said board shall meet at least once in each year at the state capitol, for the purpose of holding an examination, and in addition thereto whenever and wherever the president or secretary, by order of the president, shall call a meeting. A majority of said board shall constitute a quorum. The secretary shall keep a complete record of the proceedings of the board, which record shall be open to public inspection at all reasonable times.

Sec. 5. Certificates authorizing the practice of optometry shall be

issued, after the passage of this act, only to persons who have reached the age of twenty-one years, are of good moral character, have a preliminary education equivalent to two or more years in a public high school, and also have studied at least three years in the office of a registered optometrist, or have been actually engaged in refraction for three years, or have actually attended and graduated from a recognized school of optometry, and upon a critical examination are found to possess the requisite scholarship in optometry. Upon the presentation of satisfactory evidence, verified by oath, of such qualification, such person may make application for examination for a certificate authorizing him to practice optometry. The application shall be in writing, directed to the secretary of said board of examiners, requesting to be examined in optometry. The application must be filed with the secretary not less than fifteen days before the time of examination, and be accompanied by the sum of twenty dollars for the use and benefit of said board. If the applicant shall successfully pass such examination, he shall have issued to him a certificate signed by the president and secretary of said board, authorizing him to practice optometry in the State of Utah, upon a further payment of five dollars to said secretary, for the use of said board, and he shall receive therewith a certified copy of said certificate. Additional certified copies of said certificate, while it may remain in force, shall be furnished by the board for a fee of fifty cents for each additional copy. All persons successfully passing such examination shall be registered in the board register, which shall be kept by said secretary, as licensed to practice optometry. Provided, that nothing in this act shall be so construed as to permit or authorize any person or persons, other than the individual holding a certificate, to practice thereunder or by its authority, or under the guise of practicing under the direction of the legal holder thereof.

Sec. 6. Recipients of certificates issued under Section 5 of this act, and all other persons holding certificates entitling them to practice optometry at the time of the passage of this act, shall file a certified copy thereof for record with the county recorder of the county in which they desire to practice, and any person traveling from one county to another in this state shall, before engaging in the practice of optometry in such other county, file a certified copy of said certificate for record with the county recorder of said county to which he removes and pay the recorder thereof, for the recording of the same in a book to be kept for that purpose. Provided, that any failure, neglect or refusal on the part of any person holding a certificate to practice optometry to present the first certified copy thereof which is required to be recorded, for recording with the county recorder, as hereinbefore provided, for one month after the issuance of his certificate, shall forfeit the certificate, and the board shall be entitled to a fee of one dollar for issuing a certificate in lieu of the one forfeited.

Sec. 7. Every person holding a certificate to practice optometry in the State of Utah shall display the said certificate, in its entirety, in a conspicuous place in his office, wherein the practice of optometry is conducted. He shall, also, deliver to each customer or person fitted with glasses by him in case the work is not done in his permanent office,

a receipt which shall contain his signature, the number of her certificate and his home postoffice address.

Sec. 8. The board shall have power to revoke any certificate to practice optometry granted by it under the provisions of this act whenever it shall appear that the holder thereof has been wilfully guilty of fraud or deceit, either in procuring the same or in his practice, or by advertising optical business or treatment, or giving advice in which untruthful or misleading statements are made, or when it is made to appear to the board that such person is incompetent, or is not of good moral character, or is afflicted with an infectious or contagious disease. Provided, that before any certificate shall be revoked, the holder thereof shall have written notice of the charge or charges against him, and a day specified in said notice, which shall be at least ten days if served in the county where the hearing is to be held, after the service thereof; otherwise twenty days after service; that he be given a public hearing, and have an opportunity to produce testimony in his behalf, and confront the witnesses against him. Provided, further, that upon the revocation of any certificate the holder thereof may appeal said matter to the district court of the county in which the practitioner resides, in the manner as is now or may hereafter be provided for appeals from justices' courts, and such laws are hereby made applicable. The secretary of said board shall send the files and a copy of the minutes in the matter before the board to the clerk of the district court of the county in which the appeal is taken, and such minutes and files shall constitute the records on appeal. The witnesses at all hearings before the board shall testify under oath, and for that purpose may be sworn by any member of the board. The board shall have power to compel the attendance of witnesses, and the production of documents at any such hearings. Any person, whose certificate has been revoked, may have the same regrantd, upon satisfactory proof that the disqualification has ceased, or his disability removed.

Sec. 9. Every registered optometrist who desires to continue the practice of optometry in this state, shall, annually, on or before the first day of April, pay to the secretary of said board the sum of two dollars for such year, for which he shall receive a receipt, which shall permit him to practice optometry in all those counties of this state in which a certified copy of his said certificate is on file or of record in accordance with law, unless his said certificate be revoked under the provisions of law. Should any person or persons default in the payment of any such annual fees, his certificate may be revoked by said board upon twenty days' notice of the time and place of considering such revocation. But no license shall be revoked for such non-payment, if the person so notified shall pay, before or at the time set for such consideration, his fee and such penalty as may be imposed by said board. Provided, that said board may impose a penalty of five dollars and no more on any one person so notified, as a condition of allowing his license to stand.

Sec. 10. Each member of the board may receive as compensation, out of the funds coming into their possession, the sum of five dollars for each day actually engaged in the duties of his office, and mileage at the rate of three cents per mile for all distances necessary traveled

in going to and returning from meetings of the board. Said expenses shall be paid from the fees, fines and assessments received by the board under the provisions of this act, upon claim approved by the state board of examiners and the state auditor, and upon the warrant of the state auditor, and the state shall not be liable for any of the fees, salaries or expenses of said board, in excess of the amount received from this source. All moneys received under the provisions of this act shall be paid into the state treasury the last day of each month, and placed to the credit of the state optometry fund, and are hereby constituted a state optometry fund, which money shall be used for meeting expenses of said board and carrying out the provisions of this act, and the treasurer of said board shall give a surety bond to the State of Utah, the amount of which shall be fixed by the board, and shall be in a sum not less than twice the amount held by said treasurer at any time during the year next preceding the time of fixing such bond, the cost thereof to be paid out of the funds held by the board.

Sec. 11. On or before the first day of January preceding each biennial session of the legislature, this said board shall make a report of its proceedings to the governor, which report shall contain an account of all moneys received and disbursed by it pursuant to this act.

Sec. 12. Any person who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor.

Sec. 13. Nothing in this act shall be construed to apply to persons licensed to practice medicine or surgery in this state, nor to persons who sell spectacles, eyeglasses or lenses, either on prescription from oculists or from duly qualified and licensed optometrists, or as merchandise from permanently located and established places of business, but who neither practice nor profess to practice optometry, or who neither advertise nor hold themselves out as qualified to fit or adjust any lenses or lens as an aid or assistance to human eyesight.

Sec. 14. Sections 1686x, 1686x1, 1686x2, 1686x3, 1686x4, 1686x5, 1686x6, 1686x7, 1686x8, 1686x9, 1686x10, 1686x11 and 1686x12, Compiled Laws of Utah, 1907, are hereby repealed.

Approved March 19, 1915.

NEBRASKA OPTOMETRY LAW.

1907.

Chapter 55, Article XI.

Section 1. *Definition; Application of Article.*—The practice of optometry is defined to be the employment of any means, other than the use of drugs, for the measurement of the powers of vision, and the adaptation of lenses for the aid thereof. The provisions of this article shall not be construed to apply to permanently located physicians duly licensed to practice medicine under the laws of this state nor to persons who sell spectacles or eyeglasses on prescription from any duly qualified optometrist or physician, nor to permanently located dealers in spectacles or eyeglasses who neither practice nor profess to practice optometry.

Sec. 2. *The State Board of Examiners*—The governor is hereby authorized and directed on or before July first, 1907, to appoint a board of examiners in optometry. Such board shall consist of three persons, who shall have been residents of the state actually engaged in the prac-

tice of optometry for at least five years. For the purpose of such appointment, the Nebraska State Optical Society shall furnish to the governor the names of twice the number of examiners to be appointed, and thereafter similarly for each vacancy or new appointment, and the governor may select said board from the names so furnished. The term of each member of said board shall be three years and until his successor is appointed, and vacancies shall be filled for the unexpired term only, but in the original appointment of the members one shall be appointed for the term of one year, one for two years, and one for three years from July 1st, 1907. No member of any optical school or college, or instructor in optometry, or connected in any way therewith, shall be eligible to an appointment upon the state board of optometry.

Sec. 3. *Powers of Board.* Said board of examiners shall make such rules and regulations not inconsistent with the law as may be necessary to the proper performance of its duties, and each member thereof may administer oaths or take testimony concerning any matter within the jurisdiction of the board. It shall organize by selecting one of its members as president, one as secretary and treasurer, and shall meet at least twice a year, and at such other times as it may deem necessary, and at such place or places as it may select. A majority of the board present shall constitute a quorum, and its meetings shall at all times be open to the public.

Sec. 4. *Examinations; Certificates for Practitioners.* Every person desiring to commence or continue the practice of optometry after January 1st, 1908, except as hereinafter provided, shall take an examination before said board of examiners, to determine his qualifications therefor. Every candidate successfully passing such examination shall be registered by said board of examiners, as possessing the qualifications required by this article, and shall receive from said board a certificate therefor; but any person who shall have been continuously engaged in the practice of optometry for more than two years next prior to the passage of this article shall be entitled, upon submitting satisfactory proof thereof to said board to receive from said board a certificate of exemption from such examination. Every person entitled to a certificate of exemption as herein provided must make application therefor and present the evidence to entitle him thereto on or before January 1st, 1908, or he shall be deemed to have waived his right to such certificate. Any certificate issued by said board of examiners may be revoked by the board for just cause, after a hearing upon due notice to the holder thereof.

Sec. 5. *License Fees.* Every registered optometrist shall in every year after 1907, pay to said board of examiners the sum of one dollar as a licensee fee for such year; such payment shall be made prior to the first day of April in each and every year and in case of default of payment of such fee by any person, his certificate may be revoked by the board of examiners.

Sec. 6. *Certificate to be Recorded and Displayed.* Every person to whom a certificate of either registration or exemption shall be issued shall immediately cause the same to be recorded in the clerk's office in the county of his residence and principal office wherein he practices optometry. Every person practicing optometry must also display his

certificate of registration or exemption in a conspicuous place in the principal office wherein he practices optometry, and whenever required exhibit such certificate to said board of examiners or its representatives. And whenever practicing said profession of optometry outside of, or away from said principal office or place of business, he shall deliver to each customer or person so fitted with glasses a bill of purchase, which shall contain his signature, home and postoffice address, and the number of his certificate of registration, or exemption.

Sec. 7. *Fees.* The fees for such examination shall be \$15.00, for a certificate of registration \$10.00, for a certificate of exemption \$5.00, and for yearly license \$1.00; same to constitute a fund for the expenses made necessary by this act. From the fees so paid the board shall cause to be paid all necessary expenses incurred in the administration of this act, including the reasonable compensation of the examiners for their services and their necessary expenses; said fees of each examiner not to exceed \$5.00 per day for each day engaged in the duties of his office, with actual expenses incurred by him in the discharge of such duties, and no salary or other fees whatsoever shall be paid any member thereof, and it is further provided, that the fees herein specified shall be paid out of the fund received by the board under provisions of this act, and from no other fund or source, and all moneys in excess of actual requirements as herein specified shall be paid annually into the state treasury. The fee to be paid to the county clerk for recording a certificate shall be fifty cents.

Sec. 8. *Violation of Article.* Any violations of the provisions of this act shall be a misdemeanor. No person not a holder of a certificate of registration or exemption duly issued to him and recorded as above provided shall, after January 1st, 1908, practice optometry within this state. The practice of, or offering to practice optometry, or the public or private representation of being qualified to practice the same by any person not authorized to practice optometry shall be sufficient evidence of a violation of this act. Any person who shall violate any of the provisions thereof shall be deemed guilty of a misdemeanor and upon conviction shall be punished by a fine not to exceed one hundred dollars (\$100.00) or imprisonment in the county jail not to exceed thirty days or by both such fine and imprisonment.

WEST VIRGINIA OPTOMETRY LAW.

1909.

House Bill 38. Chapter 73 of Acts of 1909.

Section 1. The practice of optometry is defined to be the employment of any means other than the use of drugs, medicines or surgery for the measurement of the powers of vision, the employment of tests or examination for the determination of the natural and functional deficiencies of the eye and the adaptation of lenses for the aid thereof.

Sec. 2. The governor shall appoint within ninety days after the passage of the act a board of examiners in optometry. Such board of examiners shall consist of five optometrists, who shall possess sufficient knowledge of theoretical and practical optics to practice optometry, and who shall have been residents of this state actually engaged in the practice of optometry for at least three years. The term of each member of the board shall be for three years, or until his successor is

appointed, and vacancies shall be filled for the unexpired term only, but in the original appointment of the members of the board two shall be appointed for a term of one year, two for two years and one for three years from July 8, 1909. Said board of examiners shall make such rules and regulations not inconsistent with the laws as may be necessary for the proper performance of its duties; such members shall receive \$5.00 per diem and traveling expenses to and from the place of meeting, to be paid out of the state treasury. Any member of the board may, upon being duly designated by the board, or the majority thereof, administer oaths or take testimony concerning any matter within the jurisdiction of the board.

Sec. 3. Every person desiring to commence or to continue the practice of optometry later than six months after the passage of this act, except as hereinafter provided, upon presentation of satisfactory evidence verified by oath, that he is more than 21 years of age, and of good moral character, shall be examined by said board to determine his or her qualifications. Such proof shall consist of three members of the West Virginia State Optical Society. And such examination shall be confined to such as Gross' anatomy of the eyes, and the use of the ophthalmoscope, retinoscope, ophthalmometer and the use of trial lenses, the general laws of optics and refraction as is essential to the practice of optometry. Every candidate successfully passing such examination shall be registered by said board as possessing the qualifications required by this act and shall receive from said board a certificate thereof; but any person who shall submit to said board of examiners satisfactory proof as to his character, competency and qualifications, and that he has been continuously in the practice of optometry for more than two years prior to the passage of this article, may upon the recommendation of said board of examiners receive a certificate of exemption from such examination, which certificate shall be registered and entitle him to practice optometry under this article. Any one claiming to be qualified to examine eyes for the adjustment of glasses shall be deemed as practicing optometry. Every person entitled to a certificate of exemption as herein provided must make application therefor and present the evidence to entitle him thereto on or before the expiration of six months after the passage of this act or he shall be deemed to have waived his right to such certificate. Before any certificate is issued it shall be numbered and recorded in a book kept by the secretary of the said board of examiners and its number shall be noted upon the certificate. A photograph of the person registered shall be filed with the record and a duplicate thereof affixed to the certificate. In all legal proceedings the record and photograph so kept by the board of examiners or certified copies thereof shall be prima facie evidence of the facts stated herein.

Sec. 4. Every person to whom a certificate of either registration or exemption shall be issued shall immediately cause the same to be recorded in the clerk's office of the county of his residence, and also in the clerk's office of each other county wherein he shall then practice or thereafter commence to practice optometry; every person practicing optometry must also display his certificate of registration or exemption in a conspicuous place in the principal office wherein he practices

optometry and whenever required exhibit such certificate to said board of examiners or its authorized representatives. And whenever practicing said profession of optometry outside of or away from said office or place of business he shall deliver to each customer or person so fitted with glasses a bill of purchase which shall contain his signature, home office address and the number of his certificate of registration or exemption, together with a specification of the lenses furnished.

Sec. 5. The fee for such examination shall be \$15.00, for certificate of registration \$10.00, and for certificate of exemption \$5.00. Such fees shall be paid into the state treasury and the legislature shall appropriate therefrom an amount sufficient to pay all proper expenses incurred pursuant to this act. The fee to be paid to county clerk for recording a certificate shall be 50 cents.

Sec. 6. Said board shall have the power to revoke any certificate granted by it under this act for conviction of crime, habitual drunkenness, fraud or deceit in his practice or grossly incompetent to practice. Provided, however, that before any certificate shall be revoked the holder thereof shall have written notice of the charge or charges against him, and the day specified in said notice at least five days after the service thereof at which a public hearing is to be given where the accused shall have an opportunity to produce testimony in his behalf and to confront the witnesses against him. Three of the members of the board shall be a quorum to such hearing.

Sec. 7. No person not a holder of a certificate of registration or exemption duly issued to him and recorded as herein provided shall six months after the passage of this act practice optometry, within this state. No person shall falsely impersonate a registered optometrist of a like or different name, nor buy, sell or fraudulently obtain a certificate of registration or exemption issued to another practicing optometrist. Offering to practice optometry, or the public representation of being qualified to practice the same by any person not authorized to practice optometry, shall be deemed sufficient violation of this act and shall for each offense be fined not less than \$25.00 nor more than \$100.00 or imprisoned not more than three months, or both.

Sec. 8. Nothing in this act shall be construed to apply to physicians and surgeons authorized to practice under the laws of West Virginia or to prohibit any established merchant or jeweler from keeping and offering for sale spectacles or eyeglasses to any person or persons wishing to purchase the same.

DELAWARE OPTOMETRY LAW.

1909.

Be It Enacted by the Senate and House of Representatives of the State of Delaware in General Assembly Met:

Section 1. The practice of optometry is hereby defined to be the employment of any means, other than the use of drugs, or surgery, for the measurement of the powers of vision and the adaptation of lenses for the aid thereof.

Sec. 2. It shall be unlawful for any person to practice optometry in the state of Delaware unless he shall first have obtained a certificate of registration and filed the same, or a certified copy thereof, with the

clerk of the peace of the said county of his residence, all as hereinafter provided.

Sec. 3. There is hereby created a board, whose duty it shall be to carry out the purposes and enforce the provisions of this act, and shall be styled the Delaware State Board of Examiners in Optometry. Said board shall be appointed by the governor as soon as practicable after the passage of this act, and shall consist of three persons engaged in the actual practice of optometry, and residing of the state of Delaware, one from each county. Each member of said board shall hold office for a term of two years, and until his successor is appointed. Appointments to fill vacancies caused by death, resignation or removal shall be made for the residue of such term by the governor. The members of said board, before entering upon their duties, shall respectfully take and subscribe to an oath to exercise the duties of their office with fidelity, which said oath shall be filed with the clerk of the peace of the county in which said member resides. And said board shall have a common seal.

Sec. 4. Said board shall choose at its first regular meeting, and annually thereafter, one of its members president, and one secretary and treasurer thereof, who severally shall have the power during their term of office to administer oaths and take affidavits, certifying thereto under their hand and seal of the board. Said board shall meet at least once in each year at the city of Wilmington, and in addition thereto, whenever and wherever the president and secretary thereof shall call a meeting; a majority of said board shall at all times constitute a quorum. The secretary of said board shall keep a full record of the proceedings of said board, which records shall at all reasonable times be open to public inspection.

Sec. 5. "Every person before beginning to practice optometry in this state, after the passage of this act, must be twenty-one years of age, of good moral character, have a good common school education, and have graduated from a school of optometry maintaining a standard satisfactory to said board of optometry, and shall take an examination before said board of examiners to determine his qualifications." Such examination shall be confined to such knowledge as is most essential to the practice of optometry. Any person having signified to said board his desire to be examined by them shall appear before them at such time and place as they may designate, and before beginning such examination shall pay to the secretary of said board, for the use of said board, the sum of ten dollars. All persons successfully passing such examination shall be registered in the board register, which shall be kept by said secretary, as licensed to practice optometry, and shall also receive a certificate of such registration, to be signed by the president and secretary of said board, which shall be filed as hereinbefore provided. If an applicant be rejected, he shall be entitled to be admitted to another examination occurring not less than three months thereafter without further payment, but for all subsequent examinations, which shall not occur at intervals of less than three months, he shall pay an examination fee of five dollars.

Sec. 6. Every person who is actually engaged in the practice of optometry in the state of Delaware, at the time of the passage of this

act, shall, within six months thereafter, file an affidavit in proof thereof with said board and pay to it the sum of one dollar as a registration fee, and shall pay a license to the state of ten dollars. The said board shall make and keep a record of such person and shall issue to him a certificate of registration.

Sec. 7. All persons entitled to a certificate of registration under the provisions of Sec. 6, who have had an office open in this state for six months prior to the passage of this act, shall be exempt from the provisions of Sec. 5 of this act.

Sec. 8. Upon presentation to him of a proper certificate from said Delaware State Board of Examiners in Optometry and the payment to him of the sum of ten dollars for the use of the state and fifty cents for issuing the same, the clerk of the peace of the county wherein said applicant resides shall issue a license signed by the governor and countersigned by the secretary of state and sealed with the seal of his office, certifying that such person is authorized to practice optometry. Said license shall be effective for one year from the date thereof, after which a new license may be issued upon the same terms and conditions hereinbefore provided.

Sec. 9. Any person entitled to a certificate, as provided for in Sec. 6 of this act, who shall not within six months after the passage thereof make written application to the board of examiners for certificate of registration, accompanied by a written statement, signed by him and duly verified before an officer authorized to administer oaths within this state, fully setting forth the grounds upon which he claims such certificate, shall be deemed to have waived his right to a certificate under the provisions of such section. Any failure, neglect or refusal on the part of any person holding such certificate to file the same for record, as hereinbefore provided, for six months after the issuance thereof, shall forfeit the same.

Sec. 10. Every person to whom a certificate of examination or registration is granted shall display the same in a conspicuous part of his office wherein the practice of optometry is conducted; and the word "Optometrist" shall appear on his sign, together with his name.

Sec. 11. Out of the funds coming into the possession of said board each member thereof may receive as compensation the sum of five dollars for each day actually engaged in the duties of his office, and mileage at three cents per mile for all distance necessarily traveled in going to and coming from the meetings of the board. Said expenses shall be paid from the fees and assessments received by the board under the provisions of this act, and no part of the salary or other expenses of the board shall ever be paid out of the state treasury. All moneys received in excess of said per diem allowance and mileage, as above provided for, shall be held by the secretary and treasurer as a special fund for meeting expenses of said board and carrying out the provisions of this act, and he shall give such bonds as the board shall from time to time direct, and the said board shall make an annual report of its proceedings to the governor on the first Monday in January of each year, which report shall contain an account of all moneys received and disbursed by them pursuant to this act.

Sec. 12. Every registered optometrist who desires to continue the

practice of optometry in this state shall annually on such date as the board of optometry may determine, pay to the secretary of the said board a registration fee to be fixed by the board, but which shall in no case exceed the sum of two dollars per annum, for which he shall receive a renewal of said registration; and in case of default in such payment, by any person, his certificate may be revoked by the board of examiners upon twenty days' notice to the said person of the time and place of considering such revocation. But no certificate shall be revoked for such non-payment if the person so notified shall pay said fee before or at such time of consideration and such penalty as may be imposed by said board, provided that said board may impose a penalty of five dollars and no more on any one person so notified, as a condition of allowing his certificate to stand; also provided that said board of examiners may collect any such fees by suit.

Sec. 13. Said board shall have power to revoke any certificate of registration granted by it under this act for conviction of crime, habitual drunkenness for six months immediately before a charge to be made, gross incompetency or contagious disease; provided that before any certificate shall be so revoked, the holder thereof shall have notice in writing of charges against him, and at a day specified in said notice, at least five days after the service thereof, be given a public hearing and have opportunity to produce testimony in his behalf and confront the witnesses against him. Any person whose certificate has been so revoked, may, after the expiration of ninety days, apply to have the same regranted, and the same shall be regranted him upon a satisfactory showing that the disqualification has ceased.

Sec. 14. Any person who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction, shall be fined not less than twenty-five dollars, nor more than one hundred dollars, one-half of which shall be paid to the person who shall give the information leading to conviction, and the other half to the state, and in default of payment of said fine, shall be imprisoned in the county jail at the rate of one day for every two dollars of the fine so imposed. It shall be unlawful for any person, other than one legally qualified to practice medicine and surgery in this state, to make use of, or prescribe, a drug or drugs in the practice of optometry, or for the treatment of diseases of, or injury to, the human eye.

Sec. 15. Any justice of the peace in the state of Delaware shall have jurisdiction of violations of this act.

Sec. 16. Nothing in this act shall be construed to apply to any person who sells spectacles or eyeglasses in the ordinary course of trade who do not attempt to use a trial case or employ subjective and objective mechanical means to determine the accommodative and refractive states of the eye, and nothing in this act shall in anywise apply to practicing physicians in this state.

Sec. 17. This act shall take effect and be in force from and after its passage.

IOWA OPTOMETRY LAW.

1909.

Iowa Optometry Law is similar to the Florida Optometry Law.

Certificate for practitioners from other states. The board of examin-

ers may issue a certificate to any person taking up a permanent residence in the State of Iowa, and desiring to practice optometry, providing satisfactory evidence is furnished of his qualifications, including credentials from the state board of examiners in optometry of the state in which he formerly resided, and upon payment of a fee of fifteen dollars.

MAINE OPTOMETRY LAW.

1909.

Be it enacted by the people of the State of Maine as follows:

Section 1. There shall be and is hereby created a board which shall be known as the Maine State Board of Registration and Examination in Optometry, whose duty it shall be to carry out the provisions of this act. Said board shall consist of five members, three of whom shall have been resident opticians, engaged in the actual practice of optometry in the State of Maine for a period of five years prior to their appointment; one an oculist who in like manner has been engaged in the practice of his profession for five years prior to his appointment; and one a physician in actual practice; not more than three of whom shall belong to the same political party. The appointments to this board shall be made by the governor within thirty days after this law goes into effect. Of those so appointed two shall serve for one year, one for two years, and the other two for three years. The successors of all shall be appointed by the governor and shall serve for a term of three years each, and each shall hold his office until his successor is appointed. Appointments to fill vacancies from any cause shall be made by the governor for the residue of such term. The members of the board, before entering on their duties, shall each take and subscribe to the oath required to be taken by other state officers, which shall be administered by the secretary of state and filed in his office; and said board shall have a common seal. Any member of said board may be removed by the governor for cause.

Sec. 2. Said board shall at its first regular meeting, which shall be held within 15 days after their appointment, and annually thereafter, elect from its members a president, a secretary and a treasurer, who shall severally have the power, during their term of office, to administer such oaths and take such affidavits as are required by the provisions of this act, certifying thereto under their hand and the seal of the board. Said board shall meet at least once in each year at Augusta, and, in addition thereto, whenever and wherever the president and secretary thereof shall call a meeting; a majority of said board shall at all times constitute a quorum. The treasurer and secretary shall each give bond in the sum of not less than two thousand dollars, with sureties to be approved by the governor, which bond shall be filed with the state auditor. The secretary shall keep a full record of the proceedings of said board, which record shall at all reasonable times be open to public inspection. Said board shall from time to time establish and record, in a record kept for that purpose, a schedule of the minimum requirements which must be complied with by applicants for examination before they can be examined or receive a certificate. In like manner said board shall establish and put on record a schedule of the minimum requirements and rules for the recognition of schools of optometry so as to keep the requirements of proficiency up to the average standard of

other states. But no rule or requirement shall be made that is unreasonable, or that contravenes any of the provisions of this act.

Sec. 3. Every person before beginning the practice of optometry in this state after ninety days from the date when this act takes effect shall pass an examination before the state board of examiners. Such examination shall be confined to such knowledge as is essential to the practice of optometry. Any person having signified to said board his desire to be examined shall appear before such board at such time and place as they may designate, and before such examination shall pay to said board the sum of five dollars, and if he shall successfully pass said examination shall pay to said board a further sum of ten dollars on the issuance to him of a certificate. All persons successfully passing such examination shall be registered in a record which shall be kept by the secretary of said board, as licensed to practice optometry, and shall also receive a certificate of such registration to be signed by the president and secretary of said board.

Sec. 4. That the practice of optometry be defined as follows: The employment of mechanical means for testing and measuring the refractive and accommodative conditions of the eye, without the employment of drugs or medicine, and the measuring and grinding of lenses, the fitting, bending and adjusting of spectacles and eyeglasses with lenses for the betterment of vision: Provided, that the fitting or peddling of spectacles and eyeglasses by itinerant opticians prior to this act shall not be construed to mean the practice of optometry within the meaning of this act.

Sec. 5. After ninety days from the day when this act takes effect it shall be unlawful for any person to practice optometry in the State of Maine, unless he shall first obtain a certificate of registration from the board, hereby created, and file the same with the clerk of the supreme judicial court of the county in which he proposes to practice, as in this act provided.

Sec. 6. Nothing in this act shall be considered to apply to physicians and surgeons authorized to practice medicine and engage therein under the laws of the State of Maine, nor to resident merchants so long as they sell spectacles as any other piece of merchandise without representation of qualification in the practice of optometry on the part of the seller.

Sec. 7. Upon application and the payment of the sum of five dollars said board shall issue, without the prescribed examination, to persons practicing optometry in those states which, in the opinion of the board, equal the standard of the State of Maine in the requirements of such practice, a certificate to practice in this state, which certificate shall be filed in the same manner as that issued to residents of the State of Maine; provided, however, that such certificate shall be issued only to the residents of such states as allow similar privileges to residents of the State of Maine.

Sec. 8. Every person who has been engaged in the actual and continuous practice of optometry as defined by Section 4 in the State of Maine, for three years immediately prior to the time when this act takes effect, shall within ninety days thereafter file affidavit in satisfactory proof thereof with said board, which shall make and keep a

record of such persons, and shall upon the payment of the sum of five dollars issue to him a certificate of registration.

Sec. 9. All persons entitled to a certificate of registration under the provisions of Section 8 of this act shall be exempt from the provisions of Section 3.

Sec. 10. Every person receiving a certificate under the provisions of this act shall present the same for record to the clerk of the supreme judicial court of the county in which he intends to practice, and shall pay to such clerk fifty cents for recording the same, which certificate shall be recorded by the clerk in a record to be provided by him for that purpose.

Sec. 11. In case of change of residence from one county to another in this state, the holder of an optometrist's license shall obtain a new license in the county where he proposes to reside by filing with the clerk of the supreme judicial court for such county the license obtained by him in the county in which he last resided, in the same manner as provided for on the presentation of his certificate from the state board of registration and examination in optometry, and the clerk shall issue to him a new license.

Sec. 12. It shall be the duty of the clerk of the supreme judicial court of the county in which an applicant so intends to practice to issue to the person presenting such certificate as hereinbefore provided, a license over his official seal in the following form:

State of Maine, County of....., ss.

I....., clerk of the supreme judicial court of.....County, in the State of Maine, do hereby certify that.....has complied with the laws of Maine relating to the practice of optometry in the county and state aforesaid.

Witness my hand and seal of said court this.....day of

....., Clerk.

Sec. 13. The clerk of courts in each county shall furnish annually on the first day of January to the Maine State Board of Registratic and Examination in Optometry, upon blanks furnished by such board, a duplicate list of all certificates received and licenses issued by him during the preceding year, and shall include therein the date of issue of such license, and the name and residence of the person receiving the same.

Sec. 14. Any person entitled to a certificate, as provided for in Section 8 of this act, who shall not within ninety days after this act takes effect, make written application to the board of examiners for a certificate of registration, accompanied by a written statement, signed by him, and duly verified before an officer authorized to administer oaths within this state, fully setting forth the grounds upon which he claims such certificate, shall be deemed to have waived his right to a certificate under the provisions of said Section 8. Any failure, neglect or refusal on the part of any person holding such certificate to file the same for record, as hereinbefore provided, for thirty days after the issuance thereof, shall forfeit the same.

Sec. 15. Every person to whom a certificate of examination or registration is granted shall display the same in a conspicuous part of his

office wherein the practice of optometry is conducted. And whenever practicing said profession of optometry outside of, or away from said office or place of business, he shall deliver to each customer or person so fitted with glasses, a bill of sale, which shall contain his signature, home postoffice address, and the number of his certificate of registration.

Sec. 16. Out of the funds coming into the possession of said board each member thereof may receive as compensation the sum of five dollars for each day actually engaged in the duties of his office and the actual expenses incurred in attending and meetings of the board. The secretary and treasurer shall be reimbursed for all necessary expenses incurred while discharging their duties to the board at their homes.

Said expense shall be paid from the fees and assessments received by the board under the provisions of this act, and no part of the salary or other expenses of the board shall ever be paid out of the state treasury. The treasurer shall pay the per diem and expenses as provided herein, only on the itemized verified statement of the person entitled thereto. All moneys received over and above said per diem allowance and expenses, as above provided for, shall be held by the treasurer as a special fund for meeting expenditures of said board and carrying out the provisions of this act. Said board shall make an annual report of its proceedings to the governor on the first Monday in January of each year, which report shall contain an account of all moneys received and disbursed by them pursuant to the act: Provided, however, that all moneys in excess of five hundred dollars, as shown by such report to be on hand and unexpended, shall be paid annually into the general school fund.

Sec. 17. Every registered optometrist shall in every year after 1909 pay to the said board of examiners the sum of two dollars as a license fee for each year. Such payment shall be made prior to the first day of April in each and every year, and in case of default in such payment by any person his certificate may be revoked by the board of examiners. Such fees shall be accounted for under Section 16.

Sec. 18. Said board may refuse to grant a certificate to any person guilty of felony, gross immorality or habitual drunkenness, or affected with contagious or infectious disease; and may, after notice and hearing, revoke a certificate and any license which may have been granted thereon, for like cause.

Sec. 19. To open an office for the purpose of practicing optometry or to announce to the public in any way an intention to practice optometry in any county in the state shall be prima facie evidence of engaging in the practice of optometry within the meaning of this act.

Sec. 20. Any person who shall after ninety days from the day when this act takes effect, be, or engaged in the practice of optometry in this state without first having obtained a certificate of registration from the board created by this act, shall be deemed guilty of a misdemeanor, and upon conviction may be fined not less than fifty dollars nor more than two hundred dollars.

Approved March 18, 1909.

WASHINGTON OPTOMETRY LAW.

1909.

Chapter 235. (S. B. 247.)

Be it enacted by the Legislature of the State of Washington:

Section 1. The practice of optometry is defined to be the employment of any means, other than the use of drugs, for the measurement of the powers of vision and the adaptation of lenses for the aid thereof.

Sec. 2. That a board to be known as the Board of Examiners in Optometry, for the State of Washington, is hereby established. Said board shall consist of three members, who will possess sufficient knowledge of theoretical and practical optics to practice optometry, and who shall have been residents of this state, actually engaged in the practice of optometry for at least five years. The term of each member of the said board shall be three years, or until his successor is appointed and qualified, and vacancies shall be filled for the unexpired term only; but in the original appointment of the members of the board, one shall be appointed for the term of one year, one for two years, and one for three years, from July 1, 1909. Said board shall be appointed by the governor of this state within 90 days after this act shall become effective and annually thereafter as vacancies occur. After the first board has been appointed only licensed optometrists shall be eligible to appointment. No member of said board shall be a stockholder, member of the faculty, or on a board of trustees of any school of optometry, or financially interested in a manufacturing or wholesale optical house.

Sec. 3. The members of said board shall qualify by taking oath of office before a notary public, or other officer empowered to administer oaths in the county in which each one, respectively, resides. At the first meeting of said board, after each annual appointment, the board shall elect a president, vice-president and secretary-treasurer. A majority of said board shall at all times constitute a quorum. Regular meetings shall be held at least once a year, at such time and place as shall be deemed most convenient for applicants. Due notice of such meetings shall be given by publication in such papers as may be selected by the board. Special meetings may be held upon a call of two members of the board. The board may prescribe rules, regulations and bylaws in harmony with the provisions of this act, for its own proceedings and government for the examination of applicants for the practice of optometry. Said board or any member thereof shall have the power to administer oaths for all purposes required in the discharge of its duties and shall adopt a seal to be affixed to all of its official documents.

Sec. 4. The board of examiners shall preserve a record of its proceedings in a book kept for that purpose, showing name, age, place and duration of residence of each applicant, the time spent in schools of optometry, and in the study and practice of same, and the year and school from which degrees were granted. Said register shall also show whether applicants were rejected or licensed, and shall be prima facie evidence of all matters contained therein. The secretary of the board shall, on March 1 of each year, transmit an official copy of said register to the secretary of state for permanent record, a certified copy of which, with hand and seal of the secretary of said board, or secretary of state, shall be admitted as evidence in all courts.

Sec. 5. From and after the passage of this act it shall be unlawful for anyone to practice optometry within the limits of this state who has not registered in the district clerk's office of the county in which he resides, and in each county in which he practices, his authority for so practicing, as herein prescribed, together with his age, postoffice address, place of birth, subscribed and certified by oath, which, if wilfully false, shall subject the applicant to conviction and punishment for false swearing, as provided by law. The fact of such oath and record shall be indorsed by the district clerk upon the certificate. The holder of the certificate must have the same recorded upon each change of residence or practice to another county, and in the absence of such record shall be prima facie evidence of the want of possession of such certificate.

Sec. 6. It is hereby made the duty of the district clerk of each organized county in this state to purchase a book of suitable size to be known as the "Optometry Register" of such county, and set apart one full page for the registration of each optometrist, and to record in said optometry register the name and record of each optometrist who presents a certificate from the board of examiners, issued under this act. The district clerk shall receive the sum of \$1.00 from each optometrist so registered, which shall be his full compensation for all duties required under this act. When an optometrist shall die or remove to another county, or have his license revoked, it shall be the duty of said clerk to make a note of the fact at the bottom of the page as closing the record. On January 1 in each year said clerk shall, upon request of the board, certify to the office of the state board of examiners in optometry a correct list of the optometrists then registered in the county, together with such other information as said board may require. Any district clerk upon conviction of knowingly violating any of the provisions of this act shall be fined not less than \$10.00 nor more than \$50.00. A copy from the optometry register pertaining to any person, certified to by said district clerk, under the seal of said court, also a certificate issued by said official, certifying that any person named has or has not registered in said office, as required by this act, shall be admitted as evidence in all trial courts.

Sec. 7. Every person desiring to commence or to continue the practice of optometry after January 1, 1910, except as hereinafter provided, upon presentation of satisfactory evidence, verified by oath, that he is more than 21 years of age, of good moral character, has a preliminary education equivalent to at least two years in a public high school, and has also studied at least three years in a registered optometrist's office, or has graduated from a school of optometry, maintaining a standard of not less than twelve months' actual attendance, said twelve months to be divided into at least two equal terms, with an interval of not less than six months separating each term, and satisfactory to the said board of examiners in optometry, shall take an examination before said board of examiners in optometry to determine his qualifications therefor. Every candidate successfully passing examination shall be registered by said board of examiners in optometry as possessing the qualifications required by this act, and shall receive from said board of examiners in optometry a certificate therefor; but any person who shall submit to said board of examiners in optometry satisfactory proof as

to his character, competency and qualifications, and that he has been continuously engaged in the practice of optometry in the state for more than two years next prior to the passage of this act, may receive from said board of examiners in optometry a certificate of exemption from such examination, which certificate shall be registered and entitle him to practice optometry under this act. Every person entitled to a certificate of exemption as herein provided, must make application therefor and present the evidence to entitle him thereto on or before January 1, 1910, or he shall be deemed to have waived his right to such certificate. Before any certificate is issued it shall be numbered and recorded in a book kept by the secretary of the state board of examiners in optometry, and its number shall be noted upon the certificate. Applications for examination must be made in writing under affidavit to the secretary of the board of examiners in optometry, and on forms prepared by said board, accompanied by a fee of \$25.00. Such applicants shall be given due notice of the date and place of examination. In case any applicant, because of his failure to pass examination, be refused a license, he or she shall, after six months, be permitted to take a second examination without additional fee. The fee for issuing a certificate of registration shall be \$15.00, and for a certificate of exemption \$10.00, to be paid to the board of examiners in optometry.

Sec. 8. The fund realized from the aforesaid fees shall be applied (first) to the payment of all necessary expenses of the board of examiners; any remaining funds shall be applied, by order of the board, to compensating members of the board in proportion to their labors: Provided, said compensation shall in no case exceed \$5.00 each per day for time occupied.

Sec. 9. All examinations shall be conducted in writing and in such manner as shall be entirely fair and impartial to all individuals and every recognized school of optometry, the applicants being known by numbers, without name or other method of identification, on examination papers, by which members of the board may be able to identify such papers until after the applicants have been granted licenses or rejected. Upon satisfactory examination, under the rules of the board, applicants shall be granted licenses to practice optometry. All questions and answers, with grades attached, shall be preserved for one year. All applicants examined at the same time shall be given identical questions. All certificates shall be attested by the official seal, and signed by all members of the board, or a quorum thereof.

Sec. 10. The state board of examiners in optometry may refuse to admit persons to its examinations or to issue the certificates provided for in this act for any of the following causes:

(First) The presentation to the board of any certificate, or testimony, which was illegally or fraudulently obtained, or when fraud or deceit has been practiced in passing an examination.

(Second) Conviction of or charged by indictment with a crime of the grade of a felony, or one which involved moral turpitude.

(Third) Other grossly unprofessional or dishonorable conduct of a character likely to deceive or defraud the public; or for habits of intemperance of (or) drug addiction, calculated to destroy the accuracy of the work of an optometrist: Providing, that any applicant who may

be refused admittance to examination before said board shall have his right of action to have such issue tried in the district court of the county in which some member of the board shall reside.

Sec. 11. The right herein to practice optometry in this state may be revoked by any court of competent jurisdiction upon proof of the violation of the law in any respect in regard thereto, or for any cause for which the state board of examiners in optometry is authorized to refuse to admit persons to its examinations, as provided in Sec. 10 of this act, and it shall be the duty of the several district and county attorneys of this state to file and prosecute appropriate and judicial proceedings in the name of the state upon request of any member of said board.

Sec. 12. Any person practicing optometry in this state in violation of the provisions of this act shall, upon conviction thereof, be fined not less than \$50.00 nor more than \$500.00, or by imprisonment in the county jail for a term not less than two months nor exceeding six months, or both, and each day of such violation shall constitute a separate offense.

Sec. 13. Nothing in this act shall be construed to apply to duly licensed physicians authorized to practice medicine under the laws of the State of Washington, nor persons who sell spectacles, eyeglasses or lenses as merchandise from permanently located and established places of business.

Sec. 14. All acts and parts of acts inconsistent with this act are hereby repealed.

Passed by the Senate March 2, 1909.

Passed by the House March 11, 1909.

An act relating to the compensation and duties of the board of examiners in optometry and the members and officers thereof, and amending Section 8473 of Remington & Ballinger's Annotated Codes and Statutes of Washington and adding Section 14 thereto relating to license fee.

Be it enacted by the Legislature of the State of Washington:

Section 1. That Section 8473 of Remington & Ballinger's Annotated Codes and Statutes of Washington be amended to read as follows:

Section 8473. Each member of the board of examiners in optometry shall receive a compensation of five dollars a day for each day he is actually and necessarily engaged in attendance upon meetings of the board, and in going to and returning from the place of meeting, and necessary expenses incurred in attending such meetings; all such compensation and expenses and all other expenses incident to the execution of the provisions of this act shall be paid by the state treasurer upon warrants drawn by the state auditor upon the presentation of proper vouchers, to be approved by a majority of said board as in the case of state officers. The secretary-treasurer of said board shall receive a compensation to be determined by said board not to exceed \$100.00 per annum. All money received or collected by said board or any member or officer thereof during any month shall be turned over before the 10th day of the succeeding month to the state treasurer, together with a verified statement showing the sources from which such money was derived.

Sec. 14. Every registered optometrist and every optometrist prac-

ting under an exemption certificate shall in every year after 1914 pay to said board of examiners the sum of \$1.00 as a license fee for such year, such payment shall be made prior to the 10th day of January in each and every year, and in case of default of payment of such fee by any person, and after twenty days' notice of such default, his certificate may be revoked by the board of examiners until such fee is paid.

Passed the House March 10, 1913.

Passed the Senate March 12, 1913.

Approved by the governor March 15, 1913.

NORTH CAROLINA OPTOMETRY LAW.

1909.

The General Assembly of North Carolina do enact:

Section 1. That the practice of optometry is defined as follows, namely: The practice of optometry is hereby defined to be the employment of any means, other than the use of drugs, medicine or surgery for the measurement of the powers of vision and the adaptation of lenses for the aid thereof.

Sec. 2. After the passage of this act it shall be unlawful for any person to practice optometry in the State of North Carolina unless he shall first have obtained a certificate of registration and filed the same or a certified copy thereof with the clerk of the superior court of his residence all as hereinafter provided.

Sec. 3 There is hereby created a board whose duty it shall be to carry out the purposes and enforce the provisions of this act, and shall be styled the "North Carolina State Board of Examiners in Optometry." Said board shall be appointed by the governor as soon as it is practicable after the passage of this act and shall consist of five regular optometrists who are members of the North Carolina State Optical Society and who have been engaged in the practice of optometry in the state of North Carolina for five years. The terms of said members as appointed as aforesaid shall be as follows: One for one year, one for two years, one for three years, one for four years, one for five years. The terms of members thereafter appointed shall be for five years. The appointment to fill vacancies shall be for the unexpired terms. The members of the board before entering upon their duties shall respectively take all oaths taken and prescribed for other state officers, which shall be administered by the secretary of state and filed in his office and said board shall have a common seal

Sec. 4. Said Board of Examiners shall choose at the first regular meeting and annually thereafter one of its members as president and one as secretary and treasurer. Said board shall make such rules and regulations not inconsistent with the law as may be necessary to the proper performance of their duties and each member thereof may administer oaths and take testimony concerning any matter within the jurisdiction of said board. A majority of the said board shall constitute a quorum. Said board shall meet at least twice a year, the time and place to be designated by the president and secretary. The secretary of said board shall keep a record of the proceedings of said board, which record shall at all reasonable times be open to public inspection.

Sec. 5. Every person before beginning to practice optometry in this state after the passage of this act shall pass an examination before said board of examiners. Such examination shall be confined to such knowledge as is essential to the practice of optometry. Any person having signified his desire to be examined, and before beginning such examination, shall pay to the said board for the use of the said board the sum of \$10.00, and if he shall successfully pass the examination he shall pay to the said secretary for the use of said board a further sum of \$5.00, on issuance to him of the certificate. Provided, any candidate presenting himself for examination and failing to successfully pass the board shall have returned to him the \$10.00 fee required in this section. All persons successfully passing said examination shall be registered in the board registry, which shall be kept by said secretary, as licensed to practice optometry, and he shall receive a certificate of registration, to be signed by the president and secretary of said board.

Sec. 6. Every person who had been engaged in the practice of optometry, in the state of North Carolina for two years prior to the date of the passage of this act shall within six months thereafter, file an affidavit as proof thereof with the said board. Secretary shall keep a record of said person and shall upon payment of \$3.00 issue to said person a certificate of registration without the necessity of an examination.

Sec. 7. All persons entitled to a certificate of registration under the full provisions of Sec. 6 shall be exempt from the provisions of Sec. 5 of this act.

Sec. 8. All recipients of said certificate of registration shall present the same for record to the clerk of the superior court if the county in which they reside and shall pay a fee of 50 cents for recording the same. Said clerk should record the said certificate in a book to be provided to him for that purpose. Any person so licensed before engaging in the practice of optometry in other county shall before commencing the practice in said county file the same for record with the clerk of the superior court of the county in which he desires to practice and pay the clerk thereof for recording the same a fee of 50 cents. Any failure, neglect or refusal on the part of such person holding such certificate to file the same for record as hereinbefore provided for thirty days after issuance thereof shall forfeit the same and said certificate shall become null and void. Upon request of any person entitled to a certificate of registration at any time the board shall issue a certified copy of the certificate of registration and upon the fact of the loss of the original certificate being made to appear, a certified copy shall be recorded in lieu of the original and that said board shall be entitled to a fee of \$1.00 for recording the certified copy of the certificate of registration.

Sec. 9. Any person entitled to a certificate as provided for in Sec. 7 of this act who shall not within six months after the passage of this act make a written application to the board of examiners for a certificate of registration accompanied by a written statement signed by him and duly verified before an officer authorized to administer oaths within this state fully setting forth the grounds upon which

he claims such certificate, shall be deemed to have waived his right to a certificate under the provisions of said section. Any such person may obtain a certificate thereafter by successfully passing examination and paying the fee as provided for in this act.

Sec. 10. Every person to whom a certificate of examination or registration is granted shall display the same in a conspicuous part of his office wherein the practice of optometry is conducted.

Sec. 11. Out of the funds coming into possession of said board each member thereof may receive as compensation a sum of \$5.00 for each day he is actually engaged in the duties of his office and mileage at 3 cents per mile for all distances necessarily traveled in going to and from the meeting of the board. The said expenses shall be paid from the fees and assessments received by the board under the provisions of this act and no part of the salary or other expenses of the board shall ever be paid out of the state treasury. All money received in excess of per diem allowance and mileage as above provided for shall be held by the secretary as a special fund for meeting expenses of said board and carrying out the provisions of this act, and he shall give the state such bond as the board shall from time to time direct for the faithful performance of his duties. And the board shall make an annual report of its proceedings to the governor the first Monday in January of each year, which report shall contain an account of all moneys received and disbursed by them pursuant to this act.

Sec. 12. Every registered optometrist shall in every year after 1909 pay to the said board of examiners the sum of not over \$2.00, the amount to be fixed by the board as a fee for said year. Said payment shall be made prior to the first day of April in each and every year, and in case of default in said payment by any person his certificate may be revoked by the examiners on twenty days' notice of a time and a place of considering said revocation. But no license shall be revoked for non-payment if the person so notified shall pay before or at such time of consideration his fee in such penalty as may be imposed by said board; provided, said board may impose a penalty of \$5.00 and no more on any one person so notified as a condition of allowing his license to stand; provided further, that said board of examiners may collect any such dues by suit.

Sec. 13. Said board shall have the power to revoke any certificate of registration granted by it under this act for conviction of crime, habitual drunkenness for six months immediately before charge to be made, gross incompetency, contagious or infectious disease. Provided, that before any certificate may be so revoked the holder thereof shall have notice thereof in writing of the charge or charges against him. And at any day specified in said notice, at least five days after the service thereof, be given a public hearing and have an opportunity to present testimony in his behalf and to confront the witnesses against him. Any person whose certificate has been so revoked may, after the expiration of ninety days, apply to have the same regranted, and the same shall be regranted him upon the satisfactory showing that the disqualification has ceased.

Sec. 14. Any person who shall violate any of the provisions of this act, and any person who shall hold himself out to the public as a

practitioner of optometry without a certificate of registration provided for in this act shall be deemed guilty of a misdemeanor, and upon conviction in any court having jurisdiction of misdemeanors may be punished as for a misdemeanor by a fine of not more than \$100.00, or imprisonment for not more than four months, or both, in the discretion of the court.

Sec. 15. Nothing in this act shall be construed to apply to physicians and surgeons authorized to practice under the laws of North Carolina or prohibit persons to sell spectacles, eyeglasses or lenses or merchandise from permanently located and established places of business.

Sec. 16. All laws and parts of laws in conflict with the foregoing are hereby repealed.

Sec. 17. That this act shall be in force and effect from and after its ratification.

Ratified this 6th day of March A. D., 1909.

KANSAS OPTOMETRY LAWS.
1909.

Section 2. Unlawful to practice unless, that it shall be unlawful for any person to practice or attempt to practice optometry in the State of Kansas, without first having received a diploma from the faculty of some reputable college, school or university department, duly authorized by laws of the State or some other of the United States, or by the laws of some foreign government, in which college, school or university department there was at the time of the issuance of such diploma, either written or oral, a full course of lectures or instructions in optometry; Provided that nothing in this section shall apply to any person engaged in the practice of optometry in this State at the passage of this Act as hereinafter provided; And provided further, That nothing in this Act shall be construed as to prevent physicians and surgeon from testing the eyes and fitting glasses, or those persons who have heretofore been registered as doctors of optics by the State Medical Board.

NOTE:—Realizing the fact that legislation cannot be retroactive and that no man should be legislated out of business in which he was lawfully engaged at the time of the passing of above Act, the above section makes liberal provision for the continuance of all those so engaged at the passage of this Act.

Sec. 3. The Board of Examiners consists of three reputable and practicing optometrists.

Sec. 6. *Certificates.* Certificates issued by the state board of examiners shall be of two grades, First and Second, and shall continue in force one year.

Sec. 12. *Examination of Others.* Any person desiring to practice optometry in this state and not holding a diploma from any school or other institution as provided in Sec. 2, shall be entitled to be examined by the Board of Examiners. Said application to be accompanied by a fee of \$5.00.

Sec. 16. Every registered optometrist shall in every year after 1909 pay to said Board of Examiners the sum of \$2.00 as a fee for a renewal of his certificate of registration for each year.

With these exceptions, the Kansas Optometry Law is similar to the Florida Optometry Law.

FLORIDA OPTOMETRY LAW.
1909.

Chapter 5947—(No. 78) and Chapter 6492—No. 72).

Be it Enacted by the Legislature of the State of Florida: *Definition.*
Section 1. That the practice of optometry, for the purposes of this Act, is defined as follows, viz: The use or employment of tests or examinations for the determination of the natural and functional deficiencies of the eye and the adaptation of lenses for the aid thereof.

Appointment of Board—Terms of Members of Board—Vacancies.
Sec. 2. There is hereby created a board to be known and styled the "Florida Board of Examiners in Optometry," to be composed of five regular opticians, residents of the State of Florida, who have been engaged in the practice of optometry in said State for two years. Said board shall be appointed by the governor as soon as practicable after the passage of this Act, one member for a term of one year, one for two years, one for three years, two for four years, and each until his successor is appointed and qualified; and the terms of members thereafter appointed shall be for four years; provided, however, that the appointments to fill vacancies, which the governor is hereby empowered to make, shall be for the unexpired term.

Officers of Board—Meeting of Board—Notice of Meeting. Sec. 3. Said board of examiners shall elect, at its first regular meeting, and annually thereafter, one of its members as president and one as secretary and treasurer, and shall hold a regular meeting at least once each year at such time and place as the said board may determine; special meetings may be called and held at such times and places as may be designated by the president and secretary, and such special meetings shall be held upon the application of five applicants for examination. At least thirty days' notice of any regular meeting shall be given by publication once a week in a newspaper of general circulation throughout the State.

Quorum. Sec. 4. Three members of said board shall constitute a quorum for the transaction of business, and should a quorum not be present on the day appointed for their meeting those present may adjourn from day to day or to some designated day until a quorum is present.

Duty of Board. Sec. 5. Said board shall make such rules and regulations not inconsistent with law as it may consider necessary to the proper performance of its duties; may take testimony concerning any matter within its jurisdiction, and each member thereof may administer oaths. It shall be the duty of said board to examine thoroughly every applicant desiring to practice optometry in this State, and if a majority of said board shall be satisfied that said person is competent and possesses the knowledge essential to such practice, they shall grant him a certificate to that effect and enter his name on their records as a registered practitioner. The secretary shall keep a full report of the proceedings of the board, which records shall at all reasonable times be open to public inspection.

Examinations—Examination Fees. Sec. 6. No person shall practice

optometry in this State, unless such person is at least 21 years old, is of good moral character, possesses an education equivalent to two years' attendance at a high school, and has had two years' study and training under an optometrist or has graduated from a school of optometry maintaining a standard of instruction satisfactory to the board of examiners provided for in said chapter 5947, laws of Florida, and shall have passed an examination before said board of examiners as provided for in Sec. 5 of said Act. Any such person having signified his desire to be so examined, shall appear before said board of examiners at such time and place as they may designate. Before taking said examination the applicant shall pay for the use of said board of examiners in defraying the legitimate expenses thereof, the sum of \$10.00, and if such person shall successfully pass such examination, he shall then pay, for the use of said board of examiners as aforesaid, the further sum of \$15.00, upon the issuance to him or her of a certificate of qualification signed by the president and secretary of said board of examiners. Any certificate of qualification so granted by said board, as aforesaid, may be revoked by said board, if the person to whom issued, after at least thirty days' notice of a time and place of hearing before said board, and given an opportunity to be heard, shall be found by said board to have been guilty of gross immoral conduct or imposition upon any person, in the practice of his profession as an optometrist; or addicted to habitual intemperance in the use of intoxicating stimulants, beverages or narcotic drugs; or found to have become incompetent as an optometrist; or to have secured his certificate of qualification through deceit or fraud.

Recording, Etc. of Certificate. Sec. 7. The certificate provided for in the two preceding sections shall be recorded in the office of the clerk of the circuit court of the county in which said practitioner may desire to sojourn, and in the county where he may practice, in a book to be kept by the clerk for that purpose, before the person to whom it is granted shall be entitled to practice by virtue thereof; and when so recorded the clerk shall certify thereon, under his official seal, the fact and date of such record, and shall return such certificate to the person to whom the same was granted, and shall be entitled for such service to collect from the holder thereof the legal fee for recording.

Disposition of Funds and Compensation of Board—Board to Report to Governor. Sec. 9. Out of the funds coming into the possession of said board, each member thereof may receive as compensation the sum of \$5.00 for each day he is actually engaged in the duties of his office, and mileage at the rate of 3 cents per mile for distance necessarily traveled in going to and coming from the meetings of the board; and the president and the secretary of said board may each receive a salary not exceeding \$25.00 per month each in addition to the foregoing fees. The said expenses and such other expenses as may be incident to the execution of this Act, and chapter 5947, laws of Florida, after being audited by said board, shall be paid from the fees, fines and assessments received by the board under the provisions of said acts; and no part of the salaries or other expenses of the board shall be paid out of the state treasury, or be a charge against

the State, nor shall the State be in any wise responsible for any indebtedness which may be created by said board. Should the fees from applicants desiring to practice optometry in this State be insufficient to defray the expenses of said board, the secretary of said board may assess a sum, not exceeding \$15.00 per annum, upon each registered optometrist, and shall give each of them sixty days' notice, by registered mail, of such assessment, and the amount thereof, and should any such registered optometrist fail to pay the sum so assessed within such sixty days, and return card from such registered notice shall have been received by said board duly signed by the optometrist to whom addressed, or his agent, then his or her certificate of qualification permitting him or her to practice optometry in this State shall thereby stand and be revoked, and said board shall thereupon strike the name of such person from the list of registered optometrists of this State. Provided, however, that such delinquent may be reinstated as a registered optometrist, and shall have the right of a renewal certificate, at any time after such revocation, on the payment of such assessment and renewal fees, together with such penalty not exceeding \$25.00, as said board may determine. Upon any certificate of qualification becoming revoked as herein provided it shall be unlawful for such optometrist to practice in this State, unless and until he thereafter be reinstated as herein provided. All moneys received by said board of examiners under the provisions of this Act, and chapter 5947, laws of Florida, shall be held by the secretary as a special fund out of which may be paid the per diem allowance, mileage of members, salaries of the president and secretary, attorney fees, and the expenses incurred by said board in carrying out the provisions of said acts. The secretary of said board shall make an annual report of its proceedings to the governor of the State of Florida on the first Monday in January of each year, which report shall contain an account of all moneys received and disbursed by them in pursuance of the provisions of said acts.

Penalty for Practicing in Violation of Act. Sec. 10. Any person who shall hold himself out to the public as a practitioner of optometry, or who shall engage in the practice of optometry, without first complying with the provisions of this Act, or who shall violate any of the provisions of said Act, shall be deemed guilty of a misdemeanor, and upon conviction, shall be punished by a fine of not more than two hundred dollars, or by imprisonment not exceeding six months.

Construction. Sec. 11. Nothing in this act shall be construed to apply to physicians and surgeons authorized to practice under the laws of Florida, nor to dealers in optical goods or stores or other places who sell spectacles or eyeglasses without the use of test case or any other instruments nor in any way leave the impression that they have the right to examine for refractive errors of the eye.

Sec. 12. All laws and parts of laws in conflict with the provisions of this Act are hereby repealed.

Approved May 21, 1909, and June 7, 1913.

RHODE ISLAND OPTOMETRY LAW.

1909.

It Is Enacted by the General Assembly as Follows:

Section 1. The practice of optometry is defined to be the employment of mechanical means, other than the use of drugs, medicine or surgery for the measurement of the powers of vision and the adaptation of lenses for the aid thereof.

Sec. 2. At the present session of the general assembly the governor, with the advice and consent of the senate, shall appoint a Board of Examiners in Optometry. Such Board of Examiners shall consist of five members who shall possess sufficient knowledge of theoretical and practical optics to practice optometry, and who shall have been residents of this State, actually engaged in the practice of optometry, for at least five years next prior to appointment.

Annually thereafter in January the governor shall, as aforesaid, appoint one registered optometrist, as hereinafter provided, as a member of said board for the term of five years from the first day of February following, or until his successor is appointed; but in the original appointment of the members of the board, one shall be appointed for the term of one year, one for two years, one for three years, one for four years and one for five years, from the first of February, 1909. Vacancies occurring in said board when the general assembly is not in session shall be filled, until the next session of the general assembly only, by the governor, as aforesaid. No member of said board shall be a stockholder, member of the faculty or on a board of trustees of any school of optometry, or financially interested in a manufacturing or wholesale optical house.

Any member of said board may be removed by the governor for such cause as he and the senate shall deem sufficient and shall express in the order of removal.

Sec. 3. The members of said board shall qualify by taking the oath provided by law for public officers before a notary public, or other officer empowered to administer oaths in this State. Said board shall meet within one month after its appointment, and annually thereafter on the first Tuesday of February, at such time and place as it shall determine, and shall organize by electing a president, vice-president, secretary and a treasurer from its members, who shall hold their offices for one year or until their successors are elected. The treasurer shall give to the general treasurer a bond of \$1,000, with sufficient sureties, to be approved by said general treasurer, for the faithful performance of his official duties. The board shall annually hold its regular meeting the first Tuesday of February, and additional meetings, when necessary, at such time and places as it shall determine. The majority of said board shall at all times constitute a quorum for the transaction of business. The board may prescribe rules, regulations and by-laws, in harmony with the provisions of this Act, for its own proceedings and government for the examination of applicants for the practice of optometry. Said board or any member thereof, shall have the power to administer oaths for all purposes required in the discharge of its duties, and said board shall adopt a seal to be affixed to all its official documents.

Sec. 4. The Board of Examiners shall preserve a record of its proceedings in a book kept for that purpose, showing receipts and disbursements, name, age, place and duration of residence of each applicant and registered optometrist, the time spent in schools of optometry and in the study and practice of same, and the year and school from which degrees were granted. Said register shall also show whether applicants were rejected or licensed, and, if licensed, give the number of the certificate of each, and said register shall be prima facie evidence of all matters contained therein. The secretary of the board shall in January of each year transmit an official copy of said register to the Secretary of State for permanent record, a certified copy of which, with hand and seal of the secretary of said board, or Secretary of State, shall be admitted as evidence in all courts.

Sec. 5. Every person desiring to commence or to continue the practice of optometry after January 1, 1910, except as hereinafter provided, upon presentation of satisfactory evidence, verified by oath, that he is more than 21 years of age, of good moral character, has a preliminary education equivalent to at least two years in a public high school, and has also studied at least three years in a registered optometrist's office, or has graduated from a school of optometry, maintaining a standard of not less than twelve months' actual attendance and satisfactory to the said Board of Examiners in Optometry, shall take an examination before said Board of Examiners in Optometry to determine his qualifications therefor. Every candidate successfully passing examination shall be registered by said Board of Examiners in Optometry as possessing the qualifications required by this Act, and shall receive from said Board of Examiners in Optometry a certificate therefor which shall have printed conspicuously upon its face the definition of optometry as contained in Sec. 1; but any person who shall submit to said Board of Examiners in Optometry satisfactory proof as to his character, competency and qualifications, and that he has been continuously engaged in the practice of optometry in the State for more than three years next prior to the passage of this Act, may receive from the said Board of Examiners in Optometry a certificate of exemption from such examination, which certificate shall be numbered and registered with the Board of Examiners in Optometry and entitle him to practice optometry under this Act.

Every person entitled to a certificate of exemption, as herein provided, must make application therefor, and present the evidence to entitle him thereto, on or before January 1, 1910, or he shall be deemed to have waived his right to such certificate. Before any certificate is issued it shall be numbered and recorded in a book kept by the State Board of Examiners in Optometry, as provided in Sec. 4 of this Act, and its number shall be noted upon the certificate. Applications for examination must be made in writing, under affidavit, to the secretary of the Board of Examiners in Optometry, and on forms prepared by said board, accompanied by a fee of \$10.00. Such applicants shall be given due notice of the date and place of examination. An applicant who fails to pass a satisfactory examination shall be entitled to one re-examination, after the expiration of three months, free of charge, at any future meeting of the Board, but for each

subsequent examination a fee of \$5.00 shall be paid. The fee for issuing a certificate of registration shall be \$10.00 and for certificate of exemption \$5.00, to be paid to the Board of Examiners in Optometry, and regularly every year thereafter a renewal certificate shall be granted, and the fee for each renewal shall be \$2.00.

Sec. 6. Every person to whom a certificate of either registration or exemption shall be granted shall immediately display his certificate in a conspicuous place in the principal office wherein he practices optometry, and whenever required exhibit such certificate to said board or its authorized representatives; and whenever practicing said profession of optometry outside of or away from said office or place of business he shall deliver to each customer or person so fitted with glasses a bill of sale, which shall contain his signature, home post-office address and the number of his certificate of registration, together with a specification of the lenses furnished and the price charged therefor.

Sec. 7. The actual expenses of said board shall be paid out of the funds received from applicants for examination and registration; provided, that in no event shall such expenses be a charge against the State. After all necessary expenses of said board have been paid by the treasurer thereof, out of the moneys received by it from said fees, including \$5.00 for each day's actual attendance to each member of said board, and 3 cents a mile for mileage, if there be funds for that purpose, the balance of the moneys received by it from said fees under this Act shall be paid to the general treasurer. No moneys shall be applied to the payment of the expenses of said board or said compensation, except that received from said fees as aforesaid.

Said board annually shall present to the general assembly, in the month of January, a detailed statement of the receipts and disbursements of said board during the preceding year, with a statement of its acts and proceedings, and such recommendations as said board may deem proper.

Sec. 8. All examinations shall be conducted in writing and in such manner as shall be entirely fair and impartial to all individuals and every recognized school of optometry; the applicants being known by numbers, without name or other method of identification, on examination papers by which members of the board may be able to identify such papers until after the applicants have been granted licenses or rejected. Upon satisfactory examination, under the rules of the board, applicants shall be granted licenses to practice optometry. All questions and answers, with grades attached, shall be preserved for one year. All applicants examined at the same time shall be given identical questions. All certificates shall be attested by the official seal and signed by all members of the board or a quorum thereof.

Sec. 9. The State Board of Examiners in Optometry may refuse to admit persons to its examinations, or to issue the certificates provided for in this Act, for any of the following causes:

(First). The presentation to the board of any certificate or testimony which was illegally or fraudulently obtained, or when fraud or deceit has been practiced in passing the examination.

(Second). Conviction of or charged by indictment with a crime of the grade of felony, or one which involved moral turpitude.

(Third). Other grossly unprofessional or dishonorable conduct of a character likely to deceive or defraud the public; or for habits of intemperance or drug addiction calculated to destroy the accuracy of the work of an optometrist; provided, that any applicant who may be refused admittance to examination before said board, or shall be refused a license, or certificate, shall have his right of action to have such issue tried in the superior court, sitting in Providence or where applicant resides.

Sec. 10. The right herein given to any person to practice optometry in this State may be revoked by the superior court upon proof of the violation of the law in any respect in regard thereto, or for any cause for which the State Board of Examiners in Optometry is authorized to refuse to admit persons to its examinations, as provided in Sec. 9 of this Act; and it shall be the duty of the attorney-general of this State to file and prosecute appropriate and judicial proceedings, in the name of the State, upon request of any member of said board.

Sec. 11. No person not a holder of a certificate of registration duly issued to him shall, after January 1, 1910, practice optometry within this State. No person shall falsely personate a registered optometrist of a like or different name, nor buy, sell, or fraudulently obtain a certificate of registration issued to another. Any person who shall practice or attempt to practice optometry in this State in violation of any of the provisions of this Act shall be punished by a fine of not less than twenty dollars nor more than one hundred dollars for each and every offense; and the failure of such person to duly register with said Board of Examiners in Optometry, or the opening or maintaining of an optometrist's office, as the displaying of an optometrist's sign or door-plate, or the advertising of a readiness to practice optometry in this state, in public prints, or by his cards, circulars, posters or in any other manner by any such person, shall be evidence of such violation.

Sec. 12. Nothing in this Act shall be construed to apply to duly licensed physicians authorized to practice medicine under the laws of the State of Rhode Island, nor to persons who neither practice nor profess to practice optometry, and who sell spectacles, eyeglasses or lenses, either on prescription from physicians or from duly qualified optometrists, or as merchandise from permanently located and established places of business.

Sec. 13. This Act shall take effect upon its passage, and all acts and parts of acts inconsistent herewith are hereby repealed.

VERMONT OPTOMETRY LAW.

1909.

It is hereby enacted by the General Assembly of the State of Vermont:

Section 1. The practice of optometry is hereby defined to be the employment of any means, other than the use of drugs, for the measurement of the powers of vision and the adaptation of lenses for the aid thereof.

Sec. 2. The State Board of Examiners in Optometry shall consist

of three persons, engaged exclusively in the practice of optometry, who shall possess sufficient knowledge of theoretical and practical optics to practice optometry, and who at the time of their appointment shall have been residents of this State actually engaged in the practice of optometry for at least five years.

Sec. 3. On or before the first day of January, 1909, the governor shall appoint the members of said board, whose terms of office shall begin on the first day of January, 1909, and expire in one, two and three years respectively from said date, as designated by the governor; and the governor shall annually thereafter appoint one member for three years to fill the vacancy caused by the expiration of the term of the outgoing member. A vacancy in the board shall be filled by the governor.

Sec. 4. Said board shall at its first meeting after appointment, elect a president, secretary and treasurer, who shall hold their respective offices for one year from the date of their election, and until their successors are chosen.

Sec. 5. Said board shall meet at least annually, and thirty days' notice of the time and place shall be given in at least two optical journals circulating in this State. At least one meeting of the board shall be held previous to the first day of July, 1909.

Sec. 6. A person desiring to commence or continue the practice of optometry after the first day of July, 1909, except as hereinafter provided, upon presentation of satisfactory evidence that he is more than 21 years of age, of good moral character, has a preliminary education equivalent to at least two years in a high school, has graduated from a recognized, standard school of optometry maintaining a two years' course of study of at least six months in each year, shall take an examination before said board to determine his qualifications therefor, and if he passes such examination shall receive a certificate thereof; but a person who has been continuously engaged in the practice of optometry in this State for more than two years next prior to the passage of this Act shall receive from said board a certificate of exemption from such examination, which shall entitle him to practice optometry under this Act. A person entitled to a certificate of exemption as herein provided shall make application therefor, and present the evidence to entitle thereto on or before July 1, 1909, or he shall be deemed to have waived his right to such certificate.

Sec. 7. A person to whom a certificate of either registration or exemption is issued shall forthwith cause the same to be recorded in the office of the Secretary of State and shall pay him 25 cents for recording the same.

Sec. 8. A person practicing optometry shall display his certificate of registration or exemption in a conspicuous place in the principal office wherein he practices. Whenever practicing outside of, or away from, said office, he shall deliver to each person whom he fits with glasses a bill of purchase, which shall contain his signature, home postoffice address and the number of his certificate of registration or exemption, together with a specification of the lenses furnished and the price charged therefor.

Sec. 9. The fee for examination shall be \$15.00, for a certificate of

registration 10.00, and for a certificate of exemption \$5.00, to be paid to the treasurer of the board. The treasurer shall make a quarterly report to the state treasurer of examinations given and certificates granted, and pay into the State treasury the money received by him therefor.

Sec. 10. Said board shall revoke a certificate of registration or exemption if the holder thereof is guilty of fraud or deceit in his practice, has been convicted of crime, is an habitual drunkard or is incompetent to practice optometry; provided that no certificate shall be revoked until the holder is given a hearing before said board. A person who shall practice optometry after the revocation of his certificate shall be deemed to have practiced without a certificate. A person whose certificate has been revoked may, after the expiration of one year from the date of such revocation, apply for a new certificate, in the manner provided for original applications; and the board may in its discretion exempt the applicant from examination and grant him a certificate of exemption.

Sec. 11. No person not a holder of a certificate of registration or exemption, duly issued and recorded, shall after the first day of July, 1909, practice optometry within this State. No person shall falsely personate a registered optometrist nor buy, sell or fraudulently obtain a certificate of registration or exemption issued to another. A person violating the provisions of this section shall be fined not more than \$100.00, nor less than \$25.00.

Sec. 12. Nothing in this Act shall be construed to apply to duly licensed physicians authorized to practice medicine under the laws of this State, nor to persons who neither practice nor profess to practice optometry, who sell spectacles, eyeglasses or lenses either on prescriptions from such physicians or from registered optometrists, or as merchandise from permanently located places of business.

Sec. 13. Each member of the Board of Examiners in Optometry shall receive \$3.00 a day for services rendered, and necessary expenses. If the amount received by the board from examinations and certificates is not sufficient to pay the per diem and expenses allowed said board, the auditor of accounts shall allow the expenses in full and such percentage of per diem that the expense to the state of the board shall not exceed the receipts of said board.

Sec. 14. This Act shall take effect from its passage.

Approved January 9, 1909.

No. 1. Acts of 1915.

Sec. 197. Section 3 of No. 152 of the Acts of 1908 is hereby amended so as to read as follows:

Sec. 3. An appointment to the State Board of Examiners in Optometry shall be made in the month of January, annually for a term of three years from and including the first day of February in the year of such appointment.

Sec. 198. Section 9 of No. 152 of the Acts of 1908 is hereby amended so as to read as follows:

Sec. 9. The fee for examination shall be fifteen dollars, for a certificate of registration, ten dollars, and for a certificate of exemption five dollars, to be paid to the treasurer of the board. The treasurer

shall quarterly, on the first day of February, May, August and November, make a report to the State treasurer of examinations given and certificates granted, and pay into the State treasury the money received by him therefor.

No. 189. Acts 1915.

An Act to Amend Section 11 of No. 152 of the Acts of 1908, Entitled "An Act Defining Optometry and Regulating the Practice Thereof."

It is hereby enacted by the General Assembly of the State of Vermont:

Section 1. Section 11 of No. 152 of the Acts of 1908 is hereby amended so as to read as follows:

Sec. 11. No person not a holder of a certificate of registration or exemption, duly issued and recorded, shall practice optometry within this State. No person shall falsely personate a registered optometrist, nor buy, sell or fraudulently obtain a certificate of registration or exemption issued to another. A person violating any of the provisions of this Act shall be fined not more than one hundred dollars, or be imprisoned in the house of correction not more than three months, or both in the discretion of the court, and shall be liable to any person injured thereby in a civil suit.

Approved February 20, 1915.

Acts of 1912.

No. 212. An Act to Amend Section 6 of No. 152 of the Acts of 1908 Relating to the Practice of Optometry.

It is hereby enacted by the General Assembly of the State of Vermont:

Section 1. Section 6 of No. 152 of the Acts of 1908 is hereby amended to read as follows:

Section 6. A person desiring to commence or continue the practice of optometry, after the first day of July, 1909, except as hereinafter provided, upon presentation of satisfactory evidence, that he is more than 21 years of age, of good moral character, has a preliminary education equivalent to at least two years in a high school, or has graduated from a recognized standard school of optometry maintaining a two years' course of study of at least six months in each year, shall take an examination before said board to determine his qualifications therefor, and if he passes such examination shall receive a certificate thereof, but a person who has been continuously engaged in the practice of optometry in this State for more than two years next prior to the passage of this Act, shall receive from said board a certificate of exemption from such examination which shall entitle him to practice optometry under this Act. A person entitled to a certificate of exemption as herein provided shall make application therefor and present the evidence to entitle him thereto on or before July 1, 1909, or he shall be deemed to have waived his right to such certificate.

Approved January 7, 1913.

MINNESOTA OPTOMETRY LAW.

1910.

5022. *Board of Optometry.*—The State Board of Optometry shall consist of five qualified optometrists appointed by the governor, each for the term of three years and until his successor qualifies, excepting

that the appointments for the term beginning January, 1910, two members shall be appointed for the term of three years, two members for the term of two years, and one member for the term of one year. Vacancies in such board shall be filled by like appointment for unexpired terms. They shall elect from among their number a president and a secretary, and may adopt a seal. For the purpose of examining applicants for certificates, the board shall meet at least once in each year at the seat of government, and may hold other meetings at its pleasure. Each member shall receive from the funds of the board five dollars a day for actual services, 3 cents a mile for necessary travel and for other necessary expenses of attending meetings, not to exceed two dollars and fifty cents a day. It may employ necessary assistants to aid in the enforcement of the provision of this subdivision, the attendant expenses of the employment of such attorney and assistants to be met from the funds of the board. The secretary shall keep a record of all proceedings including therein the name of every applicant for examination or registration, which records shall be open to public inspection.

5023. *Practice Defined. Registration.* The practice of optometry, within the meaning hereof, shall mean the employment of subjective and objective mechanical means to determine the accommodative and refractive states of the eye and the scope of its functions in general, and the adjustment, adaptation, and prescribing of lenses and other instrumentalities in aid of vision. It shall be unlawful for any person to engage therein without first procuring and filing for record a certificate of registration as a licensed optometrist pursuant to this subdivision.

5024. *Examination. Certificate.* Every person, not already a registered optometrist, desiring to practice as such, shall apply to the board for a certificate of registration. The board shall examine the applicant, and if he be found to possess the knowledge essential to the practice and is 21 years old, shall register him as a licensed optometrist and issue to him a certificate of such registration. The applicant shall pay to the board a fee of ten dollars before being examined and five dollars upon the issuance of the certificate. The board upon a hearing, of which the accused shall have ten days' written notice, may revoke the certificate of any person under conviction of crime, or shown to be grossly incompetent, afflicted with contagious or infectious disease, or guilty of habitual drunkenness for six months immediately preceding the accusation. After ninety days, upon application and proof that the disqualification has ceased, the board may reinstate such person.

5025. *Record and display of certificates.* The holder of every such certificate of registration shall file the same for record with the clerk of the district court in the county where he resides, and after record shall display it conspicuously at his place of business. Upon removal to another county, he shall there in like manner file his certificate before engaging in business therein. Such clerk's fee shall be fifty cents for recording, and one dollar for a certified copy. A failure on the part of the holder to comply with any of the foregoing provisions for six months after issuance of the certificate shall forfeit the same.

5026. *Annual fee.* Before April 1 in each year, every authorized optometrist shall pay to the board a fee of two dollars, in default of which the board, upon hearing and after twenty days' notice, may revoke the certificate of any optometrist so in default; but the payment of such fee at or before the time of hearing, with such additional sum, not exceeding five dollars, as may be fixed by the board, shall excuse the default. The board may collect such fee by suit.

5027. *Disposition of fees. Report.* All fees collected under this subdivision shall be received and held by the secretary and devoted to the uses of the board. The secretary shall give such bond as the board may from time to time require. Before the first Monday in January, annually, the board shall report to the governor its proceedings, and the items of its receipts and disbursements.

5028. *Exemptions. Penalties. Disposition of fines.* This subdivision shall not apply to authorized physicians and surgeons, not to vendors of spectacles and eyeglasses, who do not assume to adapt them to the eye. Every person who shall violate any of the provisions of this subdivision shall be guilty of a misdemeanor, the minimum punishment whereof shall be a fine of twenty dollars, or confinement in the county jail for thirty days. All fines collected shall be paid into the school fund of the county wherein the conviction is had.

NEW HAMPSHIRE OPTOMETRY LAW.

1911.

Be it enacted by the Senate and House of Representatives in general court convened:

Section 1. The governor, with the advice and consent of the council, shall appoint three skilled optometrists, one physician and one oculist of good repute residing and doing business in the state of New Hampshire, who shall constitute a board of registration in optometry; but no person shall be eligible to serve on said board unless he shall have been engaged in the practice of his profession for a period of not less than six years previous to his appointment. The term for which the members of said board shall hold their office shall be five years, except that one of the members of the board first to be appointed shall hold his office for the term of one year, one for the term of two years, one for the term of three years, one for the term of four years and one for the term of five years, respectively, and until their successor shall be duly appointed and qualified. Any vacancy occurring in said board shall be filled by the governor in conformity with this section; and any member of the board may be removed from office for cause by the governor with the advice and consent of the council.

Sec. 2. The board shall choose from its number a president and secretary and it shall meet at least once in each year. Three of said board shall constitute a quorum.

Sec. 3. Optometry is hereby defined to be the employment of all means, other than the use of drugs or surgery, for the measurement of the powers of vision and the adaptation of lenses for the aid thereof.

Sec. 4. Within six months from the time this act takes effect it shall be the duty of every person who was at the time of the passage of this act engaged in the practice of optometry in this state to cause his name, residence and place of business to be registered with said

board, who shall keep a book for that purpose. The statements of every such person shall be verified under oath in such manner as may be prescribed by the board. Every person who shall so register with said board as a practitioner of optometry and shall prove to said board that he was so engaged shall receive a certificate to that effect and may continue to practice without incurring any of the liabilities or penalties provided in this act for the practicing of optometry without a certificate from said board.

Sec. 5. All persons not provided for in section 4 may appear before said board at any of its regular meetings and be examined with reference to their knowledge and skill in optometry, and the board shall issue to such persons as it, upon examination, shall find to possess the requisite qualifications a certificate to that effect.

Sec. 6. Every certificate issued by said board shall be numbered and recorded in a book kept in the office of said board, and its number shall be noted upon the certificate.

A photograph of the person registered shall be filed with the record and a duplicate thereof affixed to the certificate. In all legal proceedings the record and photograph so kept in the office of said board, or certified copies thereof, shall be prima facie evidence of the facts therein stated.

Sec. 7. The said board shall charge each person receiving a certificate of exemption the sum of ten dollars, and each person appearing before them for examination for a certificate of qualification a fee of twenty dollars, which, in case such certificate shall not be granted shall be returned. Any person failing to pass a satisfactory examination shall be entitled to be re-examined at any future meeting of the board. The board shall make an annual report of its proceedings to the governor by the thirty-first day of December in each year. All fees received by the board shall be paid annually by the secretary of the board into the treasury of the state.

Sec. 8. The compensation and all necessary expenses of the board shall be paid from the treasury of the state. The compensation of the board shall be five dollars each for every day actually spent in the discharge of their duties and, in addition, their necessary expenses in attending the meetings of the board. Such compensation and expenses shall be approved by the board and sent to the state treasurer, who shall certify to the governor and council the amounts due; provided that the amounts so paid shall not exceed the amount received by the treasurer from the board in fees as herein specified, and so much of said receipts as may be necessary is hereby appropriated for the compensation and expenses aforesaid.

Sec. 9. Every person to whom a certificate shall be granted by said board shall cause the same to be recorded in the office of the secretary of state, the fee for such record to be fifty cents; every person practicing optometry must also display his certificate of registration in a conspicuous place in the principal office or place of business wherein he practices optometry and, whenever required, exhibit such certificate to said board or its authorized representatives. And whenever practicing said profession of optometry outside of, or away from, said principal office or place of business, he shall deliver to each customer

or person so fitted with glasses a bill of purchase, which shall contain his signature, home postoffice address and the number of his certificate of registration, together with a specification of the lenses furnished and the price charged therefor.

Sec. 10. Said board shall have power to revoke any certificate granted by it under this act, the holder of which is guilty of any fraud or deceit in obtaining his certificate or in the practice of optometry, has been convicted of crime, is an habitual drunkard, or grossly incompetent to practice optometry. Proceedings for revocation of a certificate shall be begun by serving written charges upon the accused, which may be made by said board on its own motion or by any other person. Said board shall fix a time and place for the hearing of such charges, and a copy of the charges, together with a notice of the time and place when they will be heard and determined, shall be served upon the accused at least fourteen days before the date actually fixed for said hearing. Where personal service cannot be effected and such fact is certified on oath by person duly authorized to make legal service, the board shall cause to be published at least thirty days prior to the hearing, in two newspapers published in the county in which the accused was last known to practice, a notice to the effect that at a definite time, and place a hearing will be had by said board for the purpose of hearing charges against the accused upon an application to revoke his certificate. In case there are not two newspapers published in said county, then publication may be made in the newspapers nearest to the place of residence of the accused. Said board shall have the power to compel the attendance of witnesses and at said hearing the accused shall have the right to cross-examine the witnesses against him, to produce witnesses in his defense and to appear personally or by counsel. In case said board after such hearing shall revoke the certificate, they shall transmit to the secretary of state a certificate under the seal of said board certifying that such certificate has been revoked, and the secretary of state shall upon receipt of said certificate file the same and forthwith mark said certificate revoked. Any person who shall practice optometry after his certificate has been revoked shall be deemed to have practiced optometry without a certificate. Wherever the certificate of any person has been revoked said board may, after the expiration of one year, entertain an application for a new certificate, and upon such application they may, in their discretion, issue a new certificate.

Sec. 11. It shall be unlawful for any person not a holder of such a certificate duly issued to him and recorded as herein provided, after six months from the time this act takes effect, to practice optometry within this state. It shall be unlawful for any person to falsely personate a registered optometrist of a like or different name, or buy, sell or fraudulently obtain a certificate issued to another. It shall be unlawful for any one holding such a certificate under this act to administer drugs in any form, to practice or claim to practice medicine or surgery in any sense, or to use any title or appellation intended or calculated to indicate the practice of medicine or surgery. Practicing or offering to practice optometry, or the public representation of being qualified to practice the same by any person not authorized to practice

optometry shall be prima facie evidence of a violation of this act. Any person who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than fifty nor more than two hundred dollars for each and every offense.

Sec. 12. Nothing in this act shall be construed to apply to physicians or surgeons authorized to practice medicine or surgery under the laws of this state, nor to persons who neither practice nor profess to practice optometry but who sell spectacles, eyeglasses or lenses either on prescription from such physicians or surgeons or from duly qualified optometrists, or as merchandise from permanently located and established places of business. The privilege to practice optometry without examination or payment of fees may be granted to registered optometrists from other states whenever said board of examiners shall give a certificate therefor, said certificate to be recorded, as herein provided, with reference to residents of this state, and said optometrists from other states shall otherwise be subject to all the provisions of this act.

Sec. 13. All acts and parts of acts inconsistent with this act are hereby repealed, and this act shall take effect upon its passage.

Approved April 15, 1911.

OKLAHOMA OPTOMETRY LAW.

1911.

Be it enacted by the people of the State of Oklahoma:

Section 1. The practice of optometry is defined to be the employment of any means, other than the use of drugs, for the measurement of the powers of vision, and the adaptation of lenses for the aid thereof.

Sec. 2. The governor is hereby authorized and directed to appoint within thirty days after the passage of this act, a board of examiners in optometry. Such board shall consist of three persons who shall possess a sufficient knowledge of theoretical and practical optics to practice optometry and who shall have been residents of this state actually engaged in the practice of optometry for at least five years. The term of each member of said board shall be three years, or until his successor is appointed, and vacancies shall be filled for the unexpired term only, but in the original appointment of the members, one shall be appointed for the term of one year, one for two years and one for three years from July 1, 1911.

Sec. 3. Said board of examiners shall make such rules and regulations, not inconsistent with the laws, as may be necessary to the performance of its duties, and each member thereof may, upon being authorized by a majority of the board, administer oaths, or take testimony concerning any matter within the jurisdiction of the board. It shall organize by selecting one of its members as president and one as secretary and treasurer (the latter to give bond, approved by the governor), and shall meet at least twice a year, and at such place or places as it may select. A majority of the board present shall constitute a quorum, and its meetings shall at all times be open to the public.

Sec. 4. Every person desiring to commence or continue the practice of optometry later than six months after the passage of this act, except as hereinafter provided, upon presentation of satisfactory evi-

dence verified by oath, that he is more than 21 years of age and of good moral character, and has had a preliminary education equivalent to at least two years in high school, and has studied at least two years in a registered optometrist's office or is a graduate of a standard school of optometry, teaching a full course of optics, shall be examined by said board to determine his or her qualifications and such examination shall be confined to such as anatomy of the eyes, the use of ophthalmoscope, retinoscope and the use of trial lenses, the general laws of optics and refraction, as is essential to the practice of optometry. Every candidate, successfully passing such examination, shall be registered by said board as possessing the qualifications, required by this act and shall receive from said board a certificate thereof; but any person who shall submit to said board of examiners satisfactory proof as to his character, competency and qualifications, and that he has been continuously engaged in a permanent office in the practice of optometry in this state for more than two years next prior to the passage of this act, shall be entitled to receive from said board a certificate of exemption. Every person entitled to a certificate of exemption, as herein provided, must make application therefor, and present the evidence to entitle him thereto, within six months after the passage of this act, or he shall be deemed to have waived his rights to such a certificate.

Sec. 5. Said board shall have power to revoke any certificate of registration granted by it under this act, for conviction of crime, habitual drunkenness, for six months immediately before a charge to be made, gross incompetency, exorbitant charges, false representations of goods or contagious disease. Provided, that before any certificate shall be so revoked, the holder thereof shall have notice in writing of charges against him, and at a day specified in said notice at least ten days after the service thereof, be given a public hearing and have opportunity to produce testimony in his behalf and confront the witness against him. Any person whose certificate has been revoked may, after the expiration of ninety days, apply to have same regranted him upon a satisfactory showing that the disqualification has ceased.

Sec. 6. Every person to whom a certificate of either registration or exemption shall be issued shall immediately cause the same to be recorded in the clerk's office in the county of his residence, and principal office wherein he practices optometry. Every person practicing optometry must also display his certificate of registration or exemption in a conspicuous place, and whenever required such certificate to said board of examiners or its authorized representatives. Every person practicing optometry shall deliver to each customer or person so fitted with glasses, a bill of purchase which shall contain the price charged therefor, his signature, home and postoffice address and the number of his certificate of registration or exemption.

Sec. 7. The price for such examination shall be fifteen dollars (\$15.00); for a certificate of exemption, five dollars (\$5.00) and for a yearly license, one dollar (\$1.00). Such payment for a yearly license shall be made prior to the first of July, and in case of default of payment of such fee by any person, his certificate may be revoked by the board of examiners. From the fees so paid the board shall

cause to be paid all necessary expenses incurred in the administration of this act, including a reasonable compensation of the examiners for their service and necessary expenses; said fees of each examiner not to exceed \$5.00 per day, for each day engaged in the duties of this office, with actual expenses incurred by him in the discharge of such duties, and no other salary or other fees whatever shall be paid to any member thereof, except the secretary and treasurer, who shall receive a salary of \$100.00 per year in addition to his expenses and per diem as hereinbefore provided, such salary to be paid semi-annually; and it is further provided that the fees herein specified shall be paid out of the funds received by the board under the provisions of this act, and from no other source. And it is further provided that all moneys remaining in the hands of the treasurer of said board, in excess of one hundred dollars (\$100.00), shall be turned over to the state treasurer at the end of each fiscal year, to be applied to the common school fund.

Sec. 8. No person, not a holder of a certificate of registration or exemption, duly issued to him and recorded as above provided, shall, after the expiration of six months following the passage of this act, practice optometry in this state. No person shall falsely personate a registered optometrist of a like or different name, nor buy, sell or fraudulently obtain a certificate of registration or exemption issued to another. Practicing, or offering to practice optometry, or the public representation of being qualified to practice the same by any person not authorized to practice optometry, shall be sufficient evidence of the violation of this act. Any person who shall violate any of the provisions hereof shall be deemed guilty of a misdemeanor and upon conviction thereof for each offense shall be punished by a fine of not less than twenty-five dollars (\$25.00), nor more than one hundred dollars (\$100.00), or imprisonment in the county jail not less than thirty days, nor more than ninety days, or both such fine and imprisonment.

Sec. 9. Nothing in this act shall be construed to apply to duly licensed physicians, authorized to practice medicine under the laws of the State of Oklahoma, nor to persons who neither practice nor profess to practice optometry, who sell spectacles, eyeglasses or lenses, either on prescription from such physicians or from such qualified optometrists, or as merchandise from permanently located and established places of business.

Passed by the Senate, February 1, 1911.

MASSACHUSETTS OPTOMETRY LAW.

1912.

Be it enacted by the Senate and House of Representatives in general court assembled, and by authority of the same, as follows:

Section 1. The practice of optometry is defined to be the employment of any method or means other than the use of drugs for the measurement of the powers of vision and the adaptation of lenses for the aid thereof.

Sec. 2. There shall be a board of registration in optometry consisting of five persons, citizens of Massachusetts, three of whom shall have been actually engaged in the practice of optometry, as defined

in section 1 of this act, for the five years next preceding their appointment, and two of whom shall be oculists registered under the laws of the commonwealth governing the registration of physicians. No member of the board shall be a stockholder, a member of the faculty, or on the board of trustees of any school of optometry, or financially interested in a manufacturing or wholesale optical house. The governor, with the advice and consent of the council, shall, within thirty days after the passage of this act, appoint five persons to said board, one for the term of one year, one for the term of two years, one for the term of three years, one for the term of four years, and one for the term of five years, who shall hold said office until their successors are appointed. Thereafter one member of the board shall annually, in the month of September, be appointed by the governor, with the advice and consent of the council, for the term of five years and until his successor is appointed. No member shall be eligible for reappointment. Vacancies in the board shall be filled by the governor, with the advice and consent of the council.

Sec. 3. The board shall meet on the second Tuesday of October in each year, at such time and place as it shall determine, and shall organize by electing a chairman and secretary, who shall be members of the board, and who shall hold their offices for the term of one year. The secretary shall give to the treasurer and receiver general a bond, with sufficient sureties, to be approved by the governor and council, for the faithful performance of his duties. The board shall annually hold regular meetings on the second Tuesday of February, June and November, and additional meetings at such times and places as it shall determine.

Sec. 4. The board shall keep a record of the names of all persons examined, registered or recorded hereunder, and of all moneys received and disbursed by it, and a duplicate thereof shall be open to inspection in the office of the secretary of the commonwealth. The fees received by the board shall be paid monthly by the secretary into the treasury of the commonwealth. The board shall annually, on or before the first day of January, make a report to the governor and council of the condition of optometry in this commonwealth, of all its official acts during the preceding year and of its receipts and disbursements.

Sec. 5. After October 1, 1912, except as otherwise provided in this section, no person shall practice optometry as defined in section 1 of this act, until he shall have passed an examination conducted by the board, in theoretic, practical and physiological optics, theoretic and practical optometry, and in the anatomy and physiology of the eye, and shall have been registered and shall have received a certificate of registration, which certificate shall have conspicuously printed upon its face the definition of optometry as defined in section 1. Every applicant for examination shall present satisfactory evidence, verified by oath, that he is over 21 years of age, of good moral character, has had a preliminary education equivalent to at least two years in a public high school, and has also studied the subjects herein prescribed for at least two years, or has graduated from a school of optometry maintaining a course of study of not less than two years; but any person actually engaged in the practice of optometry in this common-

wealth at the time of the passage of this act shall be entitled to take such examination merely upon proof satisfactory to the board that he is of good moral character. Any person who has been actually engaged in the practice of optometry in this commonwealth for the two years preceding the date of the passage of this act may continue in such practice for a further period of two years from the said date without taking the said examination and without the said certificate, provided that he shall, on or before said first day of October, file with the board an affidavit stating his name, usual place of business, and the date of his commencing such practice, the affidavit to be signed by a physician and two reputable merchants, certifying as to his character and business standing, and to be satisfactory to the board. The affidavit, if accepted, shall be recorded by the board. Any person whose affidavit has been so accepted and recorded and who is in actual practice shall, before the expiration of said period of two years, if he desires to continue in such practice thereafter, present himself before said board for examination, and if the board is satisfied of his competency to practice optometry, he shall be registered and receive a certificate as aforesaid. The original appointees to the board of registration shall be entitled to certificates of registration by virtue of their appointment, without examination. The fee for any examination shall be \$25.00, and those passing the examination shall receive the certificate of registration without additional charge except that any applicant who fails to pass a satisfactory examination shall be entitled free of charge to one re-examination after the expiration of three months, but for each subsequent examination a fee of \$5.00 shall be paid.

Sec. 6. Every person to whom a certificate of registration shall be granted shall immediately display his certificate in a conspicuous place in the principal office wherein he practices optometry, and shall, whenever so required, exhibit the certificate to said board or its authorized representative; and whenever practicing the said profession of optometry outside or away from said office or place of business, he shall deliver to each customer or person fitted with glasses by him a certificate which shall contain his signature, home postoffice address and the number of his certificate of registration or recorded number.

Sec. 7. Each member of the board shall receive \$10.00 for every day actually spent in the performance of his duties and his necessary traveling expenses actually incurred in attending the meetings of the board, not exceeding three cents a mile each way. Such compensation and traveling expenses and all other expenses incurred by the board under the provisions of this act shall be approved by the board, and paid by the commonwealth, but only to the amount paid over by the board. No money in excess of the amount so paid over shall be paid by the commonwealth for the said compensation or expenses.

Sec. 8. The board shall have the power to revoke any certificate of registration or the right of any recorded person to practice, or to suspend the same for fraud or deceit in practice or for conviction of crime, or for habitual drunkenness for six months immediately before the charges made, or for gross incompetency; provided, however, that before any action is taken the accused party shall have written notice of the charge or charges made against him, and a day to be

specified in the notice, to be at least five days after the service thereof, at which a public hearing is to be given, where the accused shall have an opportunity to produce testimony in his own behalf, and to confront the witnesses against him. Three of the members of the board shall be a quorum for any such hearing. Witnesses at hearings before the board shall testify under oath, and may be sworn by any member of the board. The board shall have power to compel the attendance of witnesses and the production of documents at any such hearing. Where the right of any person to practice has been revoked, as herein provided, the board may, after the expiration of one year, receive an application for a renewal of the right to practice, and upon such new application they may, in their discretion, grant such a renewal.

Sec. 9. Whoever after October 1, 1912, not being lawfully authorized to practice optometry as defined by section 1 of this act, holds himself out as a practitioner of optometry, or practices or attempts to practice optometry or attempts to determine by an examination of the eyes the kind of glasses needed by any person, or holds himself out as a registered optometrist when not so registered, or whoever impersonates another practitioner, or fails to deliver the certificate as provided in section 6 of this act, shall for each offense be punished by a fine of not less than \$50.00 nor more than \$200.00, or by imprisonment for a term not exceeding three months, or by both such fine and imprisonment.

Sec. 10. The provisions of this act, except in so far as providing that oculists shall serve upon the board, shall not apply to physicians and surgeons lawfully entitled to practice medicine in the commonwealth, nor to persons who neither practice nor profess to practice optometry, but sell spectacles or eyeglasses or lenses, either on prescription from such physicians, surgeons, or from optometrists lawfully entitled to practice in this commonwealth or as merchandise from permanently located and established places of business. But nothing herein contained shall be construed to prevent any such physician or surgeon from taking an examination and receiving a certificate of registration under the provisions of this act, nor shall this act be construed to authorize any person to administer drugs in any form, to practice or claim to practice medicine or surgery in any sense, or to use any title or appellation intended or calculated to indicate the practice of medicine or surgery.

CALIFORNIA OPTOMETRY LAW.

Senate Bill No. 297, Chapter 598.

Approved June 16, 1913.

The people of the State of California do enact as follows:

Section 1. It shall be unlawful for any person to engage in the practice of optometry or to display a sign or in any other way advertise or hold himself out as an optician or optometrist without having first obtained a certificate of registration from the state board of optometry as provided for in this act or under the provisions of a certain act entitled "An act to regulate the practice of optometry and for the appointment of a board of examiners in the matter of said regulation," approved March 20, 1903, and acts amendatory thereof.

Sec. 2. The practice of optometry is hereby defined to be the employment of any means other than the use of drugs for the measurement

of the powers or range of human vision or the determination of the accommodative and refractive states of the human eye or the scope of its functions in general or the adaptation of lenses or frames for the aid thereof.

Sec. 3. A board is hereby created to be known as the state board of optometry which shall consist of three members appointed by the governor. No person shall be eligible to appointment who is not a registered optometrist of the State of California and actually engaged in the practice of optometry at the time of such appointment. Each of the members shall hold office for a term of six years or until his successor is appointed and qualified and shall be so classified that one member of said board shall retire every two years. The present members of the California state board of examiners in optometry appointed under the provisions of the act in section number one hereof referred to, shall continue to serve and act as members of the state board of optometry, but under the provisions of this act during their respective terms or until their successors are appointed and qualified. No person shall be eligible to membership in the said state board of optometry who shall be a stockholder in, or owner of, or a member of the faculty of or of the board of trustees of any school of optometry or who shall be financially interested directly or indirectly in any concern manufacturing or dealing in optical supplies at wholesale. No member of the board shall be financially interested in any purchase or contract in which the board is interested. No member of the board shall be financially interested in the sale of any property or optical supplies to any prospective candidate for examination before the board.

Sec. 4. The powers and duties of the said state board of examiners in optometry shall be as follows:

1. To organize and elect from their members a president and secretary of said board who shall hold office for one year or until the election and qualification of a successor; to adopt and use a common seal, and establish a permanent office. The secretary of the said board before entering the discharge of his duties shall execute a good and sufficient bond to the State of California in the sum of one thousand dollars conditioned for the faithful performance of his duties as such secretary. He shall receive all fees and moneys paid to the board; keep all the records of the board and discharge such other duties as the board shall from time to time prescribe.

2. To make all necessary disbursements to carry out the provisions of this act, but only upon the signature of the president and secretary of the said board and only from the state optometry fund, including payment for the bond of the secretary of said board; payment for stationery supplies; necessary optical instruments to be used in the conduct of examinations which shall be the property of the state; the printing and circulating to all optometrists in the state, once a year, a year book containing the names and addresses of all optometrists in this state; a per diem of ten dollars for each member of the said board for each day actually spent in the performance of his duties as such, and mileage of five cents per mile for all distances necessarily traveled in going to and coming from the meetings of said board, in full compensation for all services; per diems shall not

exceed one for any calendar day, and shall not exceed two in any one calendar month, except that in months when examinations are being held per diems may be allowed for not to exceed six days in any such month. Additional compensation may be allowed the secretary not to exceed fifty dollars per month.

3. To employ agents, attorneys and inspectors to secure evidence of, report on, and prosecute to conviction all violations of this act and to employ other necessary assistants in the carrying out of the provisions of this act. No state officer shall be eligible to employment by the board.

4. To hold regular meetings at least twice a year at which an examination of applicants for certificates of registration shall be held at such places as the board shall from time to time designate and special meetings upon request of a majority of the members of said board or upon the call of the president.

5. To keep an accurate record of all the proceedings of the board and of all its meetings, of all receipts and disbursements with vouchers for all disbursements, and of all prosecutions for violations of this act, and of all examinations held for applicants for certificates of registration with the names and addresses of all persons taking examinations and their success or failure to pass such examinations. To keep an accurate inventory of all property of the board and of the state in the possession of the board and to obtain a receipt therefor from its successor. All the records of the board shall be public and shall be kept in the office of the board.

6. To visit and examine public schools wherein the science of optometry is taught in this state and accredit such public schools as shall have been found by such board to give a sufficient course of study for the preparation of optometrists.

7. To keep a register of optometrists which shall contain the names and addresses of all persons to whom certificates of registration have been issued in the State of California, together with the date of the issuance of such certificates and the place or places of business in which each optometrist is engaged, and all renewals, revocations and suspensions thereof.

8. To grant or refuse to grant certificates of resignation as herein provided and to revoke the certificate of registration of any optometrist for any of the causes specified in section eleven hereof.

9. To administer oaths and take testimony upon granting and revoking or suspending any certificate of registration.

10. To make rules for the procedure of the board and for the conduct and government of applicants for certificates of registration as optometrists not inconsistent with the provisions of this act.

11. To report to the governor annually on the first Monday in January in each year giving an accurate account of the work of the board during the preceding year with a statement of all moneys received and paid out pursuant to this act.

Sec. 5. Any person over the age of legal majority desiring to engage in the practice of optometry in this state may file an application duly verified by his oath for an examination before said board for a certificate of registration without examination as hereinafter provided,

such application to be filed with the secretary of said board at least two weeks prior to the date of any meeting at which an examination is to be held and shall set forth the following:

- (a) The name, age and address of the applicant.
- (b) The name of the optometry school attended, if any, and for what period of time such school was attended by the applicant.
- (c) The previous experience, if any, of the applicant in the practice or in assisting in the practice of optometry.
- (d) A statement of the previous examinations, if any, taken before the board and the dates of such examinations.

Such application shall be accompanied by a fee of \$20.00. In case an applicant for a certificate of registration has attended a public school of optometry, accredited as provided in section 4, subdivision 6 of this act, and shall accompany his application with a certificate from such accredited school acknowledged before an officer authorized to take acknowledgments, showing the applicant to have successfully completed one year's work in such school, the board shall issue to him a certificate entitling him to practice optometry in the State of California without examination.

Public schools within the meaning of this act are schools maintained as part of the public school system of the state by public funds, and furnishing free instruction, and none other.

Sec. 6. Examinations shall be held and given by the board at least twice a year at such time and place as the board may from time to time fix and designate at least one month prior to the date of such examination; provided, however, that one of such examinations shall be held in the city and county of San Francisco commencing with the third Monday in March of each year, and the other in the City of Los Angeles commencing with the third Monday of September of each year. At such examinations the board shall examine applicants in the anatomy of the eye, in normal and abnormal refractive and accommodative and muscular conditions and co-ordination of the eye, in subjective and objective optometry, including the fitting of glasses, the principles of lens grinding and frame adjusting, and in such other subjects as pertain to the science and practice of optometry, such subjects to be enumerated in publication by the board. In case of failure, the applicant shall be examined at the next examination only in the subjects in which he failed. All such applicants without discrimination, who shall satisfactorily pass such examination shall thereupon be registered in the board's register of optometrists and a certificate of registration shall be issued to them, under the seal and signature of the members of said board upon payment of a fee of five dollars. Such certificate shall continue in force until the first day of August in the year next succeeding.

Sec. 7. Before engaging in the practice of optometry it shall be the duty of each registered optometrist to notify the board in writing of the place or places where he is to engage or intends to engage in the practice of optometry and of any changes in his place of business, and any notice required to be given by the board to any registered optometrist may be given by mailing to such address through the United States mail, postpaid. Each registered optometrist shall annually on

or before the first day of August of each year pay to the secretary of said board a fee of two dollars for a renewal of his registration certificate and shall keep such certificate conspicuously posted in his office or place of business at all times; a period of thirty days' grace shall be allowed after the first of August, during which registration certificates may be renewed on payment of the fee of five dollars. Any registered optometrist who shall temporarily practice optometry outside or away from his regular registered place of business shall deliver to each customer or person there fitted or supplied with glasses a receipt, which shall contain his signature and show his permanent registered place of business and the number of his certificate, together with a specification of the lenses furnished and the amount charged therefor.

Sec. 8. All recipients of said certificate of registration shall present the same for filing to the clerk of the county in which they reside, and shall pay a fee of fifty cents to the clerk for recording the same. Said clerk shall record said certificate in a book to be provided by him for that purpose. Any person so licensed removing his residence from one county to another in this state, shall, before engaging in the practice of optometry in such other county, obtain from the clerk of the county in which said certificate of registration is recorded a certified copy of such certificate of registration, and shall before commencing practice in such county, file the same for record with the clerk of the county to which he removes and pay the clerk of said county for recording the same a fee of fifty cents. Any failure, neglect or refusal on the part of any person holding such certificate of registration, or certified copy of such certificate of registration to record the same as hereinabove provided, for six months after the issuance of said certificate of registration, or from the date of removal of residence shall *ipso facto* work the forfeiture of his certificate of registration, and it shall not be restored except upon the payment of twenty-five dollars to the California state board of examiners in optometry.

Sec. 9. Any person who shall violate any of the provisions of this act shall be guilty of a misdemeanor and upon conviction thereof shall be fined not less than fifty dollars nor more than two hundred and fifty dollars or by imprisonment for not less than one month or more than three months for the first offense, and for the second offense by a fine of not less than two hundred and fifty dollars nor more than one thousand dollars or by imprisonment in the county jail for not less than six months nor more than one year. All fines and forfeitures collected or received for violations of or in prosecutions under this act shall be paid one-half to the state treasurer for the benefit of the state optometry fund without demand and one-half to the school fund of the city or county where the prosecution is had. In any prosecution for a violation of section one hereof, the use of test cards, test lenses, or of trial frames shall be prima facie evidence of the practice of optometry. Trial frames and test lenses within the meaning of this act shall be any frame or lense used in testing the eye which is not sold and not for sale to customers.

Sec. 10. The provision of this act shall not be construed to prevent duly licensed physicians and surgeons from treating or fitting glasses to the human eye; nor to prohibit the sale of complete ready-to-wear

eyeglasses as merchandise from a permanent place of business in good faith and not in evasion of this act by any person not holding himself out as competent to examine and prescribe for the human eye.

Sec. 10½. It shall be unlawful for any person:

1. To sell or barter, or offer to sell or barter any certificate of registration issued by the state board of optometry; or
2. To purchase or procure by barter any such certificate of registration with intent to use the same as evidence of the holder's qualification to practice optometry; or
3. To alter with fraudulent intent in any material regard such certificate of registration; or
4. To use or attempt to use any such certificate of registration which has been purchased, fraudulently issued, counterfeited or materially altered as a valid certificate of registration; or
5. To practice optometry under a false or assumed name; or
6. To wilfully make any false statement in a material regard in an application for an examination before the state board of optometry or for a certificate of registration; or
7. To practice optometry in the State of California without having at the time of doing so a valid unrevoked certificate of registration as an optometrist; or
8. To advertise by displaying a sign or otherwise or hold himself out to be an optometrist or optician without having at the time of so doing a valid unrevoked certificate of registration from the said state board of optometry.

Sec. 11. Any person registered as provided for in this act may have his certificate of registration revoked or suspended for a fixed period by the state board of optometry for any of the following causes:

1. His conviction of a felony or misdemeanor involving a moral turpitude, in which case the record of conviction, or a certified copy thereof certified by the clerk of the court, or by the judge in whose court the conviction is had, shall be conclusive evidence of such conviction.
2. When his certificate of registration has been secured by fraud or deceit practiced upon the board.
3. For unprofessional conduct, or for gross ignorance or inefficiency in his profession. Unprofessional conduct shall mean employing what are known as "cappers" or "steerers" to obtain business; the obtaining of any fee by fraud or misrepresentation; employing, directly or indirectly any suspended or unlicensed optician or optometrist to perform any work covered by this act; the advertising of optical business or treatment or advice in which untruthful, improbable, or impossible statements are made; the use in advertising of the expression "eye specialist" in connection with the name of such optometrist, unless the person using the same is a regularly licensed physician and surgeon under the laws of this state; or habitual intemperance, or gross immorality, or shall permit another to use his certificate.
4. Who shall send a solicitor from house to house or who shall solicit from house to house.
5. When the holder is suffering from a contagious or infectious disease.

6. For any violation of the provisions of this act.

Sec. 12. Before any certificate shall be so revoked or suspended the holder thereof shall have notice in writing of the charge or charges against him and at a date specified in said notice at least five days after the service thereof be given a public hearing and have an opportunity to produce testimony in his favor, and to confront the witness against him.

The revocation or suspension of any license revoked or suspended for any of the above causes except those specified in one and two of section eleven may be set aside upon application of the person whose license has been revoked at any time within six months from the date of such revocation, upon proof being made to the satisfaction of said board that the cause of said revocation no longer exists and that the applicant has been sufficiently punished. Before setting aside the revocation of any certificate the board may in its discretion require the applicant to pass the regular examination given for applicants for certificates of registration.

Sec. 13. It shall be the duty of the secretary as soon as this act takes effect, to pay into the state treasury all moneys then in his possession or standing to the credit of the state board of optometry, and thereafter he shall, within ten days after the beginning of each month, report to the state comptroller all collections of fees and all other receipts for the preceding month, and at the same time he shall pay all such amounts into the state treasury. All such moneys shall be placed in a fund to be known as the state optometry fund, which fund is hereby created, and which shall be for the uses of the state board of optometry, claims thereon to be audited and paid in the usual manner. (An amount not to exceed three hundred dollars may be drawn from the fund herein created to be used as a revolving fund where cash advances are necessary; but expenditures from such revolving fund must be substantiated by vouchers and itemized statements at the end of each fiscal year, or at any other time when demand therefor is made by the board of control or by the comptroller.)

Sec. 14. Any member of the board who shall appropriate, retain or use for his own private use any of the funds of the board shall be guilty of a felony.

Sec. 15. This act shall be known and may be cited as the optometry law.

Sec. 16. An act entitled "An act to regulate the practice of optometry and for the appointment of a board of examiners in the matter of said regulation," approved March 20, 1903, is hereby repealed.

MICHIGAN OPTOMETRY LAW.

Act 71, Public Acts 1909, as Amended by Act 147, Public Acts 1913.

An Act to amend Sections 1, 3, 5, 6 and 8 of No. 71 of the Public Acts of 1909, entitled "An Act to provide for the examination, regulation, licensing and registration of optometrists practicing optometry, and for the punishment of offenders against this act," approved May 6, 1909.

The people of the state of Michigan enact: Section 1. Sections 1, 3, 5, 6 and 8 of Act No. 71 of the Public Acts of 1909, entitled "An Act to provide for the examination, regulation, licensing and registration

of optometrists practicing optometry and for the punishment of offenders against this act," are hereby amended to read as follows:

Section 1. The governor shall appoint, on or before November 1st, 1909, five electors of the state who shall constitute a board of examiners in optometry. All persons so appointed shall have been actively engaged in the practice of optometry in harmony with Sections 7 and 8 of this act for at least five years preceding the time of such appointment. The secretary and treasurer of said board shall furnish to the governor annually and whenever requested to do so, a complete and correct list of the registered optometrists under the provisions of this act, and the appointments of the members of said board shall at all times be made from the list of registered optometrists so furnished to the governor. The persons so appointed shall hold office respectively, two for six years, two for four years and one for two years, beginning with the first day of November, 1909, and thereafter the governor shall appoint, before the first day of November of each biennial period, such number of persons as there are terms expiring qualified as aforesaid to hold the office, for six years from the first day of November next ensuing. The governor shall also fill vacancies occasioned by death or otherwise, and may remove any member for the continued neglect of the duties required by this act. Vacancies in said board shall be filled in accordance with the provisions of this act for the appointment of the original board, and any person appointed to fill a vacancy shall hold office during the unexpired term of the member whose place he fills. No member of any optical school or college or an instructor in optometry or connected in any way therewith, nor any person connected with any manufacturing, wholesale or jobbing house of optical supplies or instruments used by optometrists shall be eligible to an appointment upon said board. The business of said board shall be transacted by and receive the concurrent vote of at least three members.

Sec. 2. The members of said board shall meet at least twice a year and at such other times as shall be deemed necessary, and at such place or places as may be selected. At the first meeting the board shall organize by selecting one of its members as president, and one as secretary and treasurer, each of whom shall hold his respective office for two years and shall have the power to administer oaths concerning any matter within the jurisdiction of said board. The said treasurer shall give his bond to the people of the state of Michigan, with two or more sureties, to be approved by the other members of said board and the governor, in the penal sum of \$1,000, or in such larger sum as said board or the governor may require, conditioned for the faithful discharge of the duties required of him by law, and to account for and pay over as required by law, all moneys received by him as such treasurer.

Sec. 3. After January 1st, 1910, all men and women engaged in the practice of optometry or who wish to begin the practice of the same in this state, shall make application to said board to be registered and for a certificate of said registration. Such registration and certificate shall be granted to such applicants, but only upon compliance with at

least one of the following conditions contained in subdivisions 1 and 2 of this section:

(1) The applicant shall be registered and given a certificate of registration if he shall present a certified copy or certificate of registration or license which has been issued to said applicant by any other state, where the requirement for registration shall be deemed by said board to be equivalent to those of this act; provided, that such state shall accord a like privilege to holders of certificates of said board. The fee for registering such applicants shall be five dollars.

(2) From and after the first day of May, 1910, any applicant for registration under this act shall be required to pass an examination as hereinafter provided. Such applicant shall be twenty-one years of age, of good moral character, and shall be possessed of an education equal to a four years' high school course, Michigan standard; provided, that should the applicant be unable to prove four years' actual attendance at a high school, then the board may determine the applicant's qualifications by proper examination, the expense of which shall not exceed five dollars, the same to be paid by the applicant. The applicant shall have been employed in the office of an optometrist registered under this act, as an assistant, for a period of not less than two years, or shall be a graduate of an optical school or college approved by this board, requiring an attendance of not less than one year's course. The said board shall examine all applicants shown to have the necessary qualifications as above set forth in normal and abnormal refractive, accommodative and muscular conditions and co-ordination of the eye, and subjective and objective optometry including the fitting of glasses, the principles of lens grinding, frame adjusting and such other subjects as may be deemed necessary by said board to determine the applicant's qualifications to practice optometry. The examination shall be deemed satisfactorily passed and the applicant registered and given a certificate of registration if he shall attain an average standing of not less than seventy-five per cent on all subjects submitted. The fee for applicants of this class shall be fifteen dollars examination fee and five dollars registration fee; provided, that in addition to the fees hereinbefore provided for, every registered optometrist shall, at the time of his registration and prior to the first day of May in each and every year thereafter, pay to the said board of examiners the sum of two dollars as a license fee for such year. Provided, further, that in default of the payment of such fee by any optometrist his certificate may be revoked by the said board after thirty days' notice of such default shall have been mailed by said board to the person so in default.

Sec. 4. The board of examiners in optometry shall refuse to issue the certificate of registration provided for in this act to any person who shall have been guilty of grossly unprofessional and dishonest conduct of a character likely to deceive the public; and said board, after due notice and hearing, may revoke the certificate issued to any optometrist who shall have become addicted to the drug habit, or who is an habitual drunkard, or whose certificate of registration was obtained or issued through error, fraud or perjury; or who shall be

guilty of an offense involving moral turpitude, when such offense shall have been established in a court of competent jurisdiction.

Sec. 5. Every person to whom a certificate of registration shall be issued shall immediately thereafter cause the same to be recorded in the office of the county clerk of the county in which the person principally carries on the practice of optometry, for which recording the county clerk shall receive a fee of fifty cents. Every registered optometrist shall display his certificate of registration in a conspicuous place in the principal office wherein he practices optometry, and whenever required to, shall exhibit such certificate to the said board or its representatives, and whenever practicing the said profession of optometry outside or away from his said principal office or place of business, he shall deliver to each customer or person so fitted with glasses a memorandum of purchase, which shall contain his signature, home and postoffice address and the number of his certificate of registration. Whenever the certificate of any registered optometrist is revoked, it shall be the duty of the secretary and treasurer of said board to notify the county clerk of the county in which said registered optometrist is legally registered, notifying him of the revocation of said certificate, and it shall be the duty of such county clerk to make a proper entry upon the records of his office showing such revocation.

Sec. 6. From the fees paid to said board, the said board shall cause to be paid all necessary expenses incurred in the administration of this act, including reasonable compensation of the examiners for their services, which compensation to each examiner shall not exceed eight dollars per day for each day actually engaged in the duties of his office, and the necessary actual expenses incurred by him in the discharge of such duties, and no salary or other fees whatever shall be paid any member thereof except the secretary and treasurer. The salary of the secretary and treasurer shall be fixed by the board biennially at the meeting by which said board shall organize. Provided, that all compensation and expenses of the members of said board or made necessary for the carrying out of the provisions of this act shall be paid out of the fees received by said board under the provisions of this act from applicants, and from no other fund or source whatsoever. Provided, further that all moneys in excess of actual requirements as hereinbefore specified, shall be paid annually to the state treasurer and be placed to the credit of the general fund.

Sec. 7. The practice of optometry is hereby defined to be the employment of any means other than the use of drugs for the measurement of the powers of vision and the determination of the accommodative and refractive states of the eye and the scope of its functions in general, and the adaptation of lenses and frames for the aid thereof; provided, that the provisions of this act shall not be considered to apply to physicians and surgeons duly licensed to practice medicine under the laws of this state, nor to prevent persons from selling spectacles or eyeglasses on prescription from any duly qualified optometrist or physician, nor to prevent any person or persons selling glasses as an article of merchandise and not trafficking or attempting to traffic upon assumed skill.

Sec. 8. It shall be unlawful for any person, registered under this

act to use, prescribe, give away, sell, offer for sale, or have in his possession for the purpose of sale, any eye remedies, lotions, salves or medicines of any kind or description, practice medicine or surgery within the provisions of Act No. 237 of the Public Acts of 1899, or acts amendatory thereto, or use the prefix Dr. or any title or appellation used in a sense to indicate the practice of medicine. It shall also be unlawful for any person not a registered optometrist under the provisions of this act to hold himself out by the use of any sign, newspaper advertisement, pamphlet, circular or the use of any sign "eyes tested here" or similar words, as qualified to practice optometry. Any person making a sworn statement or affidavit in connection with any matter relating to this act proven to be false, shall be deemed guilty of perjury and upon conviction thereof shall be punished as provided in Sec. 9 of this act.

Sec. 9. Any person violating any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than one hundred dollars or imprisonment in the county jail not to exceed thirty days, or by both such fine and imprisonment in the discretion of the court.

OPTOMETRY LAW FOR INDIANA.

Acts 1907, as Amended March 15, 1913.

Be it enacted by the General Assembly of the state of Indiana, that there be and is hereby created a board which shall be known as the Indiana state board of registration and examination in optometry, whose duty it shall be to carry out the provisions of this act. Said board shall consist of five members, four of whom shall have been resident optometrists, licensed under this act, engaged in the actual practice of optometry in the state of Indiana for a period of five (5) years prior to their appointment; and the fifth an oculist who in like manner has been engaged in the practice of his profession for five (5) years prior to his appointment; not more than three of whom shall belong to the same political party. The appointments to this board shall be made by the governor within thirty (30) days after this law goes into effect. Of those appointed two shall serve for one (1) year, one for two (2) years, and the other two for three (3) years. The successors of all shall serve for a term of three (3) years each, and each shall hold his office until his successors be appointed. Appointment to fill vacancies from any cause shall be made by the governor for the residue of such term. The members of the board, before entering on their duties, shall each take and subscribe to the oath required to be taken by other state officers, which shall be administered by the secretary of the state and filed in his office; and said board shall have a common seal. Any member of said board may be removed by the governor for cause.

Sec. 2. Said board shall meet at Indianapolis, Indiana.

Sec. 4. That the practice of optometry be defined as follows: The employment of any means other than the use of drugs, for the measurement of the powers of vision, and the adaptation of lenses for the aid thereof.

Sec. 7. *Three Years in Practice. Certificate. Fee.* Every person who has been engaged in the actual and continuous practice of op-

tometry as defined by section 4, in the state of Indiana, for three (3) years immediately prior to the time of the passage of this act shall within ninety (90) days thereafter file affidavit in satisfactory proof thereof with said board, which shall make and keep a record of such persons, and shall in the consideration in (of) the sum of five (\$5.00) dollars issue to him a certificate of registration.

Sec. 8. All persons entitled to a certificate of registration under the provisions of section 7 of this act shall be exempt from the provisions of section 3.

Sec. 9. Every person receiving a certificate under the provisions of this act shall present the same for record to the clerk of the circuit court in the county in which he intends to practice, and shall pay to such clerk fifty (50) cents for recording the same, which certificate shall be recorded by the clerk in a record to be provided by him for that purpose.

Sec. 10. In case of change of residence from one county to another in this state, the holder of an optometrist's license shall obtain a new license in the county where he proposes to reside by filing with the clerk of the circuit court the license obtained by him in the county in which he last resided, in the same manner as provided for on the presentation of his certificate from the state board of registration and examination in optometry, and the clerk shall issue him a new license. It shall be the duty of said clerk to at once notify the state board of registration and examination of the surrender of said old license, and of the issuance of said new license.

Sec. 15. All moneys received over and above said per diem, allowance and expenses, as above provided for, shall be held by the treasurer as a special fund for meeting expenditures of said board, and carrying out the provisions of this act, and said board is expressly authorized to use said funds for the purpose of prosecuting any person violating any of the provisions of this act.

Sec. 16. Every registered optician shall in every year after 1907 pay to the said board of examiners the sum of two (\$2.00) dollars as a license fee for such year. Such payment shall be made prior to the first day of April in each and every year, and in case of default in such payment by any person his certificate may be revoked by the board of examiners.

Sec. 17. Said board may refuse to grant a certificate to any person, who is grossly incompetent, guilty of felony, or gross immorality, habitual drunkenness, or afflicted with contagious or infectious disease; and may, after notice and hearing, revoke a certificate and any license which may have been granted thereon for like cause. An appeal may be taken from the action of the board to the circuit or superior court of the county in which the certificate was refused or revoked by the board, upon applicant giving a good and satisfactory bond to be approved by the court, to secure the costs of such an appeal, should the appeal be determined against him.

Sec. 19. *Penalty.* Any person who shall hereafter engage in the practice of optometry in this state, without first having obtained a certificate of registration from the board created by this act, or who shall in any other manner violate any of the provisions of this act,

shall be deemed guilty of a misdemeanor, and upon conviction may be fined in any sum not less than twenty-five (\$25.00) dollars, nor more than two hundred (\$200.00) dollars.

In other respects the Indiana Optometry Law is similar to the Maine Optometry Law.

COLORADO OPTOMETRY LAW.

1913.

Be it Enacted by the General Assembly of the State of Colorado:

Section 1. That from and after a period of ninety (90) days after this act takes effect, no person shall practice optometry in this state unless he or she shall have first obtained a certificate of competency as herein provided.

Sec. 2. That the practice of optometry is hereby defined to be the employment of any means other than the use of drugs, for the measurement of the powers of vision and the adaptation of lenses and prisms for the aid thereof.

Sec. 3. That every person desiring to enter upon the practice of optometry as herein defined, or any of the branches thereof, shall, except as herein otherwise provided, present to the state board of optometric examiners, as hereinafter constituted, an application for a certificate of competency to practice optometry in this state, together with a diploma from an optometric or optical college in good standing, said standing to be determined by said board, or evidence of study and practice of optometry of not less than three (3) years, and shall also pass an examination before said board and satisfactory to it, in theoretic, practical and physiological optics, theoretical and practical optometry and anatomy and physiology of the eye, together with such other subjects as said board may prescribe, provided that such applicant shall also satisfy said board that he or she is over twenty-one (21) years of age, of good moral character and possesses at least a fair primary education. If said diploma or other evidence and examination are satisfactory to said board it shall issue to the applicant a certificate of competency in accordance with the facts, which certificate shall entitle the holder thereof to practice optometry in this state, but not as an itinerant optometrist.

Said board shall charge and receive from all applicants for examination hereinbefore mentioned a fee of twenty-five (25) dollars, provided that in the event a certificate is granted to such applicant it shall be without additional charge, and provided that if such applicant shall fail to receive such certification, he or she shall be entitled to receive another examination, before said board, on the next date on which it shall hold examination, free of charge, or at any other subsequent date at a charge of not more than five (5) dollars.

Sec. 4. That every person practicing optometry in this state at the passage of this act, and who has been in the practice of optometry in this state for a period of two (2) years or more, prior to the passage of this act, and who desires to continue such practice, shall on or before ninety (90) days after this law takes effect, register with the secretary of the board of optometric examiners, as hereafter constituted, giving his or her name, age, place or places of business, place or places during which and at which he or she has practiced optometry,

and the length of time of such practice verified by an affidavit taken before said secretary or before any officer in this state authorized to take affidavits, and then appear in person at the discretion of the hereinafter constituted board of optometric examiners and take such a practical test or examination as will prove, to the satisfaction of said board, the applicant's fitness for the continuance of the practice of optometry in this state. The fee of such registry and examination shall not be more than the sum of five (5) dollars, and shall be paid by the applicant at the same time he or she files application for registry. Said board, if satisfied of the applicant's competency shall direct the secretary to issue to the party so registering a certificate, setting forth the acts mentioned in said application for registry and affidavit, which certificate shall entitle the holder to continue in the practice of optometry in this state but not as an itinerant optometrist.

Sec. 5. That every person practicing optometry in this state at the time of the passage of this act, who fails to register with the secretary of said board as provided by section 4 of this act, within the time therein specified, or thereafter, to establish his competency within six (6) months after his resignation, shall not be entitled to a certificate as therein provided, but shall be required to qualify as prescribed in section 3 of this act.

Sec. 6. That every person to whom a certificate of competency to practice optometry shall be granted by said board, shall immediately display the same in a conspicuous place in his or her principal office or place of business wherein he or she practices optometry, and, whenever required, shall exhibit the same to any member of said board, or its authorized representative, and, whenever practicing said profession outside or away from said office, shall deliver to each customer or person served a receipt or statement containing his name, postoffice address and the number of his certificate and date thereof.

Every person receiving a certificate from said board to practice optometry in this state, shall before he or she commences such practice, file with the county clerk of the county in which he or she proposes to practice, the date and number of their certificate with their name, place of business and residence. The fee for such filing shall be fifty cents, paid by applicant at the time of filing.

Sec. 7. That the board of optometric examiners herein provided for shall consist of five optometrists to be appointed by the governor, each of whom shall be a citizen of the state of Colorado and each of whom shall have been actually engaged in the practice of optometry as herein defined for the five years next preceding his appointment, and each of whom except the first appointments shall have received prior to his appointment a certificate of competency as herein provided for. The first appointment shall be made from the membership of the Colorado State Optical Society. No licensed physician shall be eligible for appointment on said board. The members of said board first appointed by virtue of their appointment by the governor, shall be entitled to certificates of competency conferring the right to continue in the practice of optometry in this state, and such certificates shall be issued to said board free of all charges. Any three members of said board shall constitute a quorum for the purpose of holding ex-

aminations, granting certificates, or transacting any business connected with said board.

Sec. 8. That within thirty (30) days after their appointment, the first state board of optometric examiners shall meet in the city and county of Denver and organize; they shall at said first meeting elect one of their number as president, another as vice-president and another as secretary, who shall serve for one year, or until their successors are elected and qualified, which election shall be on a date to be fixed by said board at its first meeting and which date shall not be more than twelve (12) months from said first meeting. Said board shall further name one of its members to serve for the term of one year; one for the term of three years; one for the term of four years, and one for the term of five years, deciding by lot or agreement among themselves as to their respective terms. Said board shall report to the governor of this state within thirty (30) days of said first meeting, the names of the respective members and the terms of office selected or allotted to them, and at the expiration of said terms each new member shall be appointed by the governor for the full term of five (5) years.

Said board shall have power and authority to make and adopt rules, regulations and by-laws and define the powers of the officers not in conflict with this act, for its proper management and government; and said board shall adopt a seal which shall be affixed to all official papers and certificates of said board, and to employ such clerical and other assistance or help as it may deem necessary. The said board shall have power to grant certificates of competency to practice optometry to those qualified therefor as herein provided, and to refuse to grant such certificates to those not so qualified.

The president and secretary of said board shall be authorized to administer oaths in any matters pertaining to the duties of said board, or any matter connected therewith, and shall have authority to hear and take evidence concerning all matters coming before the board. Any false oaths taken before the president or secretary of the board shall be punished as perjury as denounced by existing future laws.

Sec. 9. That said board shall hold at least two meetings each year in the city and county of Denver, in the months of April and October, the exact date to be fixed by the board and published once in two daily newspapers and notice sent to all applicants for examination.

Sec. 10. That all fees and charges of said board shall be paid to the secretary, who shall deposit same as often as required by law with the state treasurer, and the state treasurer shall place all moneys so received in a special fund to be known as the fund of the state board of optometric examiners, and shall pay the same out on warrants drawn by the auditor of state therefor, upon vouchers issued and signed by the president and secretary of said board. Said moneys so received and placed in said fund may be used by said board in defraying their expenses in carrying out the provisions of this act. Any balance in said fund at the end of any biennial period shall revert to the general fund. That each member of said board shall be entitled to five (5) dollars per day for each and every day actually spent in attendance on said board's business together with his necessary travel-

ing expenses, payable from the fund of the state board of optometric examiners.

Said board shall make a return to the governor of this state at least once a year, giving in detail a statement of the receipts and expenditures of said board. Said statement to be verified by the oaths of the president and secretary.

Sec. 11. That said board shall have the right to revoke any certificates of competency to practice optometry, for fraud or deceit in the practice of his or her profession on the part of any holder thereof, for conviction of crime, for habitual drunkenness for at least six (6) months preceding such charge, or for incompetency, provided that before any such person is suspended or removed, or his or her certificate is revoked, that he or she be entitled to a public trial with the right of witnesses. At all trials three (3) members of said board shall constitute a quorum and a majority of said board's vote shall be necessary to suspend, remove or revoke.

Whenever the right of any person to practice optometry has been suspended or revoked, the said board shall, in their discretion, be authorized to receive an application to reinstatement, provided the applicant shall possess the qualifications prescribed in section 3 of this act.

Sec. 12. That it shall be unlawful for any person holding a certificate of competency to practice optometry in this state to become an itinerant practitioner without first having received a license from the said board to engage in such practice in this state.

Sec. 13. That the state board of optometric examiners shall have the power to issue to persons holding a certificate of competency a license to become itinerant practitioners upon the payment of a fee of two (2) dollars per year. No fraction of a year's license shall be granted.

The itinerant practitioner of optometry shall be defined as a person, either principal or agent, who engages in a temporary or transient practice in this state, either in one locality or traveling about the country or from place to place, or from house to house, soliciting in person or by advertisement patrons for optometry services.

Sec. 14. That whoever, not being authorized to practice optometry in this state as herein provided for, holds himself out as an optometrist or practitioner of optometry as herein defined, or practices or attempts to practice optometry or holds himself out as a qualified optometrist when not so qualified, or who impersonates a qualified and registered optometrist, or advertises or claims to be able to correct optical defects of the eye, whether for pay or otherwise, or who practices optometry as an itinerant, or attempts so to do without being licensed so to do as herein provided, or who in any other manner violates any of the provisions hereof, shall be guilty of a misdemeanor and shall, for each offense, be punished by a fine of not less than fifty (50) dollars or more than three hundred (300) dollars, or by an imprisonment in the county jail for not less than one month, or more than three months, or both in the discretion of the court.

Said board of optometric examiners, through its proper officer, may cause to be issued by any competent court, a writ of injunction directed to and forbidding and restraining any person, firm or corpora-

tion from practicing optometry in any of its branches as herein defined, until such person, firm or corporation shall have obtained the certificate herein provided for, or from violating any of the provisions hereof.

Sec. 15. That nothing in this act shall be construed to apply to physicians and surgeons lawfully entitled to practice medicine in this state, nor to persons who neither practice nor profess to practice optometry, but who sell spectacles and eyeglasses as articles of merchandise; nor to opticians who make and sell lenses, spectacles and eyeglasses on prescription of such physicians and surgeons or of duly qualified optometrists nor shall anything in this act be construed to give any person holding a license under this act the right to attach the title of M. D., surgeon, doctor, physician, eye specialist, doctor of optics, doctor of refraction, doctor of ophthalmology, doctor of optometry or any word or abbreviation to his name indicating that he is engaged in the treatment or diagnosis of the diseases or injuries of the human eye, nor to use drugs or medicines in any form for the treatment or examination of the human eye.

Sec. 16. That besides and in addition to the report provided by section 10 of this act, to be made to the governor annually, the said board shall upon request transmit to the governor annually and to the general assembly at each of its regular meetings, a complete record of all of its proceedings, together with its recommendations for the improvement of the profession of optometry and the names and addresses of all registered optometrists as shown by its books.

Sec. 17. That all acts and parts in conflict or inconsistent with any of the provisions of this act be and the same are hereby repealed.

NEVADA OPTOMETRY LAW.

1913.

Regulating Practice of Optometry.

Section 1. Any person shall be deemed to be practicing optometry within the meaning of this act who shall display a sign, or in any way advertise him or herself as an optician or optometrist, or who shall employ any means for the measurement of the powers of vision, or the adaptation of lenses for the aid thereof, or who shall, in the sale of spectacles or eyeglasses or lenses use, in the testing of the eyes therefor, lenses other than the lenses actually sold.

Certificate Necessary to Practice.

Sec. 2. It shall be unlawful for any person to engage in the practice of optometry in the state of Nevada unless such person shall have obtained a certificate of registration from the Nevada state board of examiners in optometry, as hereinafter provided.

Creation of Nevada State Board of Examiners in Optometry.

Sec. 3. Same as section 3 in Delaware Optometry Law except that the members hold office for a term of three years, one member of the board to retire every year.

Composition of the Board—Meetings.

Sec. 4. Same as section 4 in Delaware Optometry Law.

Examination by Board—Fees.

Sec. 5. Every person, before beginning to practice optometry in this state, after the passage of this act, shall pass an examination before

the said board of examiners. Such examination shall be confined to such knowledge as said board deems essential to the practice of optometry. Examinations shall be given by the board at least two times in each year, the first examination to be given on the first Monday in May and to be held in Reno, Nevada; the second examination to begin on the second Monday in October and to be held in Reno, Nevada, and at such other times as the board may deem necessary. Any person desiring to be examined by said board must fill out and swear to an application furnished by the board, and must file same with the secretary of said board at least two weeks prior to the holding of an examination, which the applicant is desirous of taking. Each applicant on making application shall pay to the secretary of the board a fee of twenty-five dollars, which shall be for the use of said board. All persons successfully passing such examination shall be registered in the board register, which shall be kept by said secretary, as licensed to practice optometry, and shall receive a certificate of such registration, to be signed by the president and secretary of said board, upon the payment to the secretary of said board of the additional sum of \$5.00, which sum shall be for the use of said board.

All Practitioners in Optometry Must Pass Examination.

Sec. 6. Every person who is actually engaged in the practice of optometry in the state of Nevada, at the time of the passage of this act, and who desires to continue the practice of the same in this state, shall, within three months thereafter, submit themselves to the provisions of section 5, and take the examination therein required, and if found qualified, the board shall, in consideration of the sum of \$5.00, issue to him or her a certificate of registration.

Entitled to Practice.

Sec. 7. All persons receiving a certificate of registration under the provision of section 6 shall be thereafter entitled to practice, subject to the provisions of this act.

Various Fees for Recording Certificates.

Sec. 8. All recipients of said certificates of registration shall present the same for filing to the clerk of the county in which they reside, and shall pay a fee of one dollar to the clerk for recording the same. Said clerk shall record said certificate in a book to be provided by him for that purpose. Any person so licensed who travels from one county to another in this state shall, before engaging in the practice of optometry in such other county, present his or her certificate of registration to the county clerk of such county for record, and the county clerk of such county shall receive a fee of one dollar for recording said certificate. Any failure, neglect or refusal on the part of any person holding such certificate of registration, or certified copy of such registration, to record the same, as hereinbefore provided, for three months after the issuance of said certificate of registration, shall ipso facto work the forfeiture of his or her certificate of registration, and it shall not be restored except upon the payment of \$25.00 to the Nevada state board of examiners in optometry.

Limit of Examinations—Alternative.

Sec. 9. Any person entitled to the provisions of section 6 of this act who shall fail to take the examination therein required, within three

months after the passage and approval of this act, shall thereafter be required to pass the examination and pay the fee as set forth in section 5 of this act.

Certificate Must be Displayed.

Sec. 10. Similar to section 10 of the Delaware Optometry Law.

Expenses of State Board, How Paid.

Sec. 11. Similar to section 11 of the Delaware Optometry Law except that the mileage is three cents per mile for all distance necessarily traveled in going to and coming from the meetings of the board.

Annual Fee Paid by Optometrists.

Sec. 12. Every reistered optometrist who desires to continue the practice of optometry in this state shall annually, on or before the first day of May of each year, pay to the secretary of said board a registration fee to be fixed by the board, and which in no case shall exceed the sum of two dollars per annum, for which he or she shall receive a renewal of such registration, and in case of the default of such payment by any person, his or she certificate shall be revoked by the board of examiners, on twenty days' notice in writing by the secretary of the time and place of considering such revocation, and the deposit of said notice in the United States postoffice, addressed to the person at his or her last known place of residence or business, and the postage prepaid thereon, shall be due and legal service thereon, but no certificate shall be revoked for such non-payment if the person notified shall pay before or at the time of considering said revocation, his or her fee and such penalty as may be imposed by said board; provided, that said board may impose a penalty not exceeding \$10.00 upon persons so notified as a condition for allowing certificates to stand valid. Any persn whose certificate of registration has been revoked for failure to pay his renewal fee, as herein provided, may apply to have the same regranted and the same shall be regranted to him or her upon his or her paying to the board all renewal fees that should have been paid had the certificate of registration not been revoked, together with a penalty of \$25.00.

Certificate May be Revoked—Causes for Revocation.

Sec. 13. Any person registered as provided in this act may have his or her certificate of registration revoked or suspended by the Nevada state board of examiners in optometry for any of the following reasons:

1. His or her conviction of a felony or misdemeanor involving moral turpitude, in which case the record of conviction, or certified copy thereof by the clerk of the court, or by the judge in whose court the conviction is had, shall be conclusive evidence.

2. When his or her certificate has been secured by fraud practiced upon the board.

3. For unprofessional conduct, or for gross ignorance or inefficiency in the profession. Unprofessional conduct shall mean employing what is known as "cappers," or "steerers," to obtain business; the obtaining of any fee by fraud or misrepresentation; employing, directly or indirectly, any suspended or unlicensed optician or optometrist to perform any work covered by this act; the advertising of optical business or treatment or advice in which untruthful or impossible statements are made; or habitual intemperance or gross immorality.

4. When the holder is suffering from a contagious or infectious disease.

Provided, however, that before any certificate shall be revoked or suspended the holder shall have notice in writing of the charge or charges against him or her, and at a date specified in said notice, at least five days after the service thereof, be given a public hearing, and have an opportunity to produce testimony in his or her favor, and to confront the witnesses against him or her. Any person whose certificate has been suspended may, after the expiration of ninety days, apply to have the same regranted, and the same shall be regranted him or her upon satisfactory showing that the disqualification has ceased.

Penalties for Violation of This Act.

Sec. 14. Any person who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction, shall be fined not less than \$50.00 nor more than \$200.00, or shall be confined not less than one month nor more than three months in the county jail, and in default of payment of said fine, shall be imprisoned in the county jail at the rate of one day for every \$2.00 of the fine imposed, and all fines thus received shall be paid to the secretary of the board for the purpose of enforcing this act.

Peace Officers to Act.

Sec. 15. Similar to section 15 of the Delaware Optometry Law.

Act Does Not Apply in Certain Cases.

Sec. 16. Nothing in this act shall be construed to apply to persons licensed to practice medicine in this state or to give any person the right to attach the title M. D., surgeon, doctor, physician, oculist, ophthalmologist, eye specialist, doctor of refraction, doctor of ophthalmology, doctor of optometry, or any word or abbreviation to his name indicating that he is engaged in the treatment or diagnosis of defects, or injuries of the human eye, or to use drugs or medicine in any form for the treatment or examination of the human eye, or to use any therapeutic measures or agencies other than glasses for the treatment of the human eye; nor to persons who merely sell spectacles, eyeglasses, or lenses as merchandise.

Must be of Legal Age.

Sec. 17. It shall be unlawful for the board of examiners in optometry to grant a certificate to any one in the state of Nevada under legal age.

Repeal.

Sec. 18. All acts and parts of acts in conflict herewith are hereby repealed.

SOUTH DAKOTA OPTOMETRY LAW.

1913.

Be It Enacted by the Legislature of the State of South Dakota:

Section 1. *Definition—Application of Article.* The practice of optometry is defined to be the employment of any means, other than the use of drugs, for the measurement of the powers of vision and the adaptation of lenses for the aid thereof. This act shall not be construed to apply to merchants or dealers who sell glasses as merchan-

dise and who do not profess to be optometrists or practice optometry as herein defined.

Sec. 2. *The State Board of Examiners.* The governor is hereby authorized and directed on or before July 1, 1913, to appoint a board of examiners in optometry. Such board shall consist of three persons, who shall have been residents of this state, actually engaged in the practice of optometry for at least five years. For the purpose of such appointment, the South Dakota Association of Optometrists shall furnish to the governor the names of twice the number of examiners to be appointed, and thereafter similarly for each vacancy or new appointment, and the governor may select said board from the names so furnished. The term of each member of said board shall be three years and until his successor is appointed, and vacancies shall be filled for the unexpired term only, but in the original appointment of the members one shall be appointed for a term of one year, one for two years and one for three years from July 1, 1913. No member of any optical school or college or instructor in optometry, or connected in any way therewith, or any jobber or jobbing representative, shall be eligible to appointment upon the state board of optometry.

Sec. 3. *Powers of Board.* Said board of examiners shall be subject to the approval of the South Dakota Association of Optometrists, make such rules and regulations not inconsistent with the law of this state, as may be necessary for the proper performance of its duties. Each member of the board shall be authorized to and may administer oaths or take testimony concerning any matter within the jurisdiction of the board.

Sec. 4. *Examinations—Certificates to Practitioners.* Every person desiring to commence or to continue the practice of optometry after January 1, 1914, except as hereinafter provided, upon presentation of satisfactory evidence, verified by oath, that he is more than twenty-one years of age, of good moral character, has a preliminary education equivalent to at least two years in a registered high school, and has also studied at least three years in a registered optometrist's office, or has graduated from a school of optometry, maintaining a standard satisfactory to said board of examiners, shall take an examination before said board of examiners to determine his qualifications therefor. Every candidate successfully passing such examination shall be registered by said board of examiners as possessing the qualifications required by this article and shall receive from said South Dakota Association of Optometrists a certificate thereof, but any person who shall submit to said board of examiners satisfactory proof as to his character, competency and qualifications, and that he or she has been continuously engaged in the practice of optometry in this state prior to the passage of this article shall, upon recommendation of said board of examiners, receive a certificate of exemption from such examination, which certificate shall be registered and entitle him or her to practice optometry under this article. Every person entitled to a certificate of exemption as herein provided must make application therefor and present the evidence to entitle him or her thereto, on or before January 1, 1914, or he or she shall be deemed to have waived his or her right to such certificate. Before any certificate is issued it shall be numbered

and recorded in a book kept in the office of the board of examiners, and its number shall be noted upon the certificate. In all legal proceedings the record is so kept in the office of the board of examiners or certified copies thereof shall be prima facie evidence of the facts therein stated.

Sec. 5. *Certificate to be Recorded and Displayed.* Every person to whom a certificate of either registration or exemption shall be issued shall immediately cause the same to be recorded in the clerk's office in the county of his or her residence, and also in the clerk's office of each other county wherein he or she shall then practice or thereafter commence the practice of optometry; every person practicing optometry must also display his or her certificate of registration or exemption in a conspicuous place in the principal office wherein he or she practices optometry and whenever required exhibit such certificate to said board of examiners or its authorized representatives. And whenever practicing said profession of optometry outside of, or away from, said office or place of business, he or she shall deliver to each customer or person so fitted with glasses a bill of purchase, which shall contain his or her signature, home postoffice address, and the number of his or her certificate of registration or exemption.

Sec. 6. *Fees.* The fee for such examination shall be \$10.00; for a certificate of registration \$5.00; and for a certificate of exemption \$3.00, to be paid to the secretary of said board and by him turned over to the treasurer. Out of such money so collected shall be paid all fees and expenses of the board of examiners, and all expenses incurred by them in the discharge of their duties, and at no time shall the legislature of the state of South Dakota make any appropriation or pay out money for the maintaining of said board of optometrists.

Sec. 7. *Registered Optometrists of this State to Constitute an Association.* The registered optometrists of this state hereby constitute an association under the name and title of the South Dakota Association of Optometrists. The purpose of which shall be to improve the science, practice and art of optometry and restrict the sale of eyeglasses or spectacles, and the adoption of lenses for the aid of vision, and the practice of optometry to regularly educated and qualified persons therefor. The association shall hold annual meetings at such time and place as may be by it determined, and it shall report annually to the governor, recommending the names of at least three members who shall be practicing optometrists, in good standing in this state, for the two years prior thereto, and otherwise qualified to be appointed as members of the state board of optometry.

Sec. 8. *Compensation of Officers.* The secretary of the state board of optometry shall be the secretary of the association and shall receive a salary which shall be fixed by the association, and shall also receive his traveling and other expenses necessarily incurred in the performance of his official duties. The members of the board shall receive a fee not to exceed \$5.00 for each day actually engaged in the service of said board and expenses necessarily incurred in the performance of their duties. Such salary and compensation of officers shall be fixed by the association at its annual meetings in each year, and all of such fees and ex-

penses shall be paid for by the fees received by the association and the state board of optometry under the provisions of this article.

Sec. 9. *License per Year.* Every registered optometrist shall, after the year 1914, pay to the said board of examiners the sum of \$1.00 as a membership fee for such year. Such payment shall be made prior to the first day of April in each and every year, and in case of default of payment of such fee by any optometrist in this state his or her certificate may be revoked or suspended, or his or her authority to practice optometry within this state may be suspended until he or she pays the same.

Sec. 10. *Penalty for Violation of this Act.* Any violation of the provisions of this act shall be a misdemeanor. No person not a holder of a certificate of registration or exemption duly issued to him or her by the state board of optometry, and recorded as in this act provided, shall, after January 1, 1914, practice optometry in this state. The practice of or offering to practice optometry or the public or private representation of being qualified to practice the same by any person not authorized to practice optometry, shall be sufficient evidence of the violation of this act, and any person who shall violate any of the provisions thereof shall be guilty of a misdemeanor and upon conviction for the first offense shall be punished by a fine not to exceed \$50.00 nor less than \$10.00. For the second offense the punishment shall be a fine of \$100.00 and 30 days' imprisonment in the county jail.

Sec. 11. All acts and parts of acts in conflict with this act are hereby repealed.

Approved March 12, 1913.

CONNECTICUT OPTOMETRY LAW.

1913.

Chapter 236 of the Acts of 1913.

Definition.

Section 1. The practice of optometry is hereby defined to be the employment of any means other than drugs for the measurement of the power of vision and the adaptation of lenses for the aid thereof.

Board of Examiners in Optometry.

Sec. 2. There shall be an examining board to be known as the Connecticut State Board of Examiners in Optometry, consisting of five regular optometrists, who shall have competent knowledge of the theoretical and practical science of optics, and shall have practiced optometry in this state for at least three years. Said board of examiners shall be appointed by the state board of health as hereinafter provided. At its regular meeting next preceding October 1, 1913, said state board of health shall appoint five members of said board of examiners to hold office as follows: Two for one year, two for two years, and one for three years, from October 1, 1913, and thereafter at its regular meeting next preceding October 1st, said state board of health shall appoint successors to those whose terms expire, as members of said board of examiners for terms of three years from October 1st following their appointments. Vacancies in said board of examiners shall be filled by the state board of health. The Connecticut State Optical Society may annually nominate to the state board of health eight optometrists for appointment on said board of examiners, and said state board

of health may select said board of examiners from said nominees or otherwise, as it may deem for the best interest of the state. Members of said board of examiners, before assuming office, shall be sworn to a faithful discharge of their duties, and shall file with the state board of health a certificate of the administration of such oath.

Meetings of the Board.

Sec. 3. Said board of examiners shall meet within thirty days after their appointment and at their first meeting and at the annual meeting on the second Tuesday in October thereafter shall choose one of their members as president, and one as secretary and treasurer. Said secretary and treasurer shall give a bond to the satisfaction of the comptroller. Said board shall make rules and regulations for its government in the transaction of its business, and each member thereof may administer oaths and take testimony when appointed to do so by the board concerning any matter within the jurisdiction of the board. A majority of said board shall constitute a quorum. Said board shall meet at least once in six months, the time and place of meeting to be designated by the president and secretary. The secretary shall keep a record of the proceedings of the board, which shall at all reasonable times be open for inspection. The board shall annually, on or before the first day of October, make a report to the state board of health of its official acts and of its receipts and expenses, with such suggestions as it may deem advisable with reference to the matters committed to its charge. All receipts and fees received by said board of examiners under this act, except such as are retained by the board under the provisions of this section, shall be paid to the state treasurer, and account rendered to the comptroller semi-annually. There shall be retained by said board of examiners at the time of such accounting such amounts as are necessary to pay their necessary expenses as approved by the comptroller, including stationery and printing. Said board of examiners shall receive no compensation for its services.

Sec. 4. Every person, before beginning to practice optometry in this state after January 1, 1914, except as hereinafter provided, shall present to said board evidence that he or she is more than twenty-one years of age, of good moral character, has a preliminary education equivalent to at least two years in high school, and has studied at least two years in a registered optometrist's office, or has graduated from a school, or college of optometry recognized as efficient by the state board of examiners, and shall take an examination before said board in the theoretical, practical and physiological science of optics, theoretical and practical optometry, and in the anatomy and physiology of the eye; and said board shall determine the qualifications of the applicant, and if found satisfactory, shall give a certificate to that effect. Said certificate shall not contain the word "doctor" or its synonym. The times and places for examination of applicants shall be determined by the board, and each applicant, before examination, shall pay to the board the sum of ten dollars, and the further sum of five dollars upon the issuance of a certificate. Any applicant failing to pass a satisfactory examination shall be entitled to one re-examination after the expiration of one month and not later than six months, free of charge. For subsequent examination a fee of five dollars shall be paid. Each applicant,

upon obtaining the certificate herein provided for shall file the same for record in the office of the secretary, who shall cause the same to be recorded in a book for that purpose; and any such certificate not so filed within thirty days after its date shall be void.

Duties of the Board.

Sec. 6. Said board may adopt rules and by-laws with reference to the display of certificates, and the number of the same by the person thus licensed, and may revoke, suspend and reissue such certificates for causes deemed by it sufficient, and may provide in its rules and by-laws for hearing with reference to all matters relating to the granting, revocation or reissuing of such certificate. Duplicate certificates may be issued by the board upon proof of loss of the original certificate, for which a fee of one dollar shall be charged.

Duties of the Secretary.

Sec. 7. The secretary shall keep accurate minutes of all the doings of the board, and shall keep a record of all certificates issued, revoked or reissued.

Penalty for Practicing Without Certificate.

Sec. 8. After January 1, 1914, no person shall practice optometry in this state unless he shall have obtained a certificate under the provisions of this act; and any person thus practicing without such certificate shall for each offense be fined not more than one hundred dollars, or imprisoned not more than three years, or both.

Construction of Article.

Sec. 9. This act shall not be construed to apply to physicians and surgeons authorized to practice under the laws of the state, nor to any persons who sell spectacles or eyeglasses on prescription from any physician or duly certified optometrist, nor to dealers in spectacles or eyeglasses who neither profess to practice nor practice optometry.

The Use of Titles.

Sec. 10. No person granted a certificate under the provisions of this act shall display or use the title of "doctor" or its synonym, either by way of prefix or otherwise. Any person violating the provisions hereof shall be subject to the penalties provided in Sec. 8 of this act.

MARYLAND OPTOMETRY LAW.

1914.

Section 1. Be it enacted by the General Assembly of Maryland, that within thirty days after the passage of this act, the governor shall appoint a board of examiners in optometry for the State of Maryland. The board shall consist of five persons, not more than two of whom may be, but not necessarily, physicians. The board shall be selected from a list of ten names endorsed by the Maryland Association of Optometrists. No person shall be eligible to appointment as a member of said board unless he has been engaged in the actual practice of optometry or ophthalmology in the State of Maryland continuously for five years last past, and a resident thereof. Vacancies from any cause shall be filled by the governor for the unexpired term from a list of four names submitted by the Maryland Association of Optometrists. Each member of said board shall hold office for a term of two years and until his successor is duly appointed and qualified.

Sec. 2. And be it enacted, That said board so appointed and its suc-

cessors, shall be known by the name of the board of examiners in optometry of the State of Maryland. Every person so appointed to serve on said board shall receive a certificate of his appointment from the governor of the State of Maryland, and within ten days after receiving such certificate he shall take, subscribe and file in the office of the secretary of state the constitutional oath of office.

Sec. 3. And be it enacted, That said board shall meet within ten days after their appointment has been made and choose a president, secretary and treasurer from the members thereof, and annually thereafter elect such officers and adopt a common seal. Each member shall have the power to administer oaths and take affidavits concerning all matters properly cognizable by said board, certifying thereto under the hand and seal of the board. Said board shall meet in the city of Baltimore at least twice a year and as often thereafter as may be necessary, and in addition thereto whenever and wherever the board shall call a meeting. A majority of said board shall at all times constitute a quorum. The secretary of said board shall keep a full record of the proceedings of said board, which shall at all reasonable times be open to public inspection. The treasurer shall receive from the secretary all fees paid for licenses and certificates and shall keep a record thereof, and of all disbursements of said board in a book to be kept for that purpose. All moneys paid to the board shall be deposited by the treasurer in some safe banking institution, and all moneys paid out shall be approved by said board and be made by check signed by both the president and the treasurer. The treasurer shall be required to give such bond as the board may exact, and the said board shall make an annual report of its proceedings to the governor, which report shall contain an account of all moneys received and disbursed by them pursuant to this act.

Sec. 4. And be it enacted, That out of the funds coming into the possession of said board, each member thereof attending the meetings for examination and registration may receive as compensation the sum of three dollars for each applicant that may be examined; and in cases of registration for the first time they may each receive as compensation for such service the sum of fifty cents, and, further, each member may receive as compensation a sum to be determined by said board which shall not exceed ten dollars for each day actually engaged in necessary duties of his office when not examining or registering applicants, and mileage at three cents per mile for all distances traveled in going to and coming from meetings of the board. All expenses shall be paid from the fees and moneys received by the board under the provisions of this act, and no moneys shall ever be paid to said board out of the state treasury. All moneys received in excess of said compensation and mileage as before provided for shall be held by the treasurer as a special fund for meeting expenses of said board and carrying out the provisions of this act.

Sec. 5. And be it enacted, That the practice of optometry is hereby defined to be the employment of any means, except the use of drugs, medicine or surgery, known to the science of optics for the purpose of determining, correcting and prescribing by means of lenses for any optical condition existing in the human eye, and also the employment

of any means, except the use of drugs, medicine or surgery, for the purpose of detecting diseased conditions.

Sec. 6. And be it enacted, That no person shall hereafter practice optometry, nor use the title optometrist in the State of Maryland unless he shall first have obtained a certificate of registration or one of examination, and filed the same for record or a certified copy thereof with the clerk of the county or city of his residence, as herein provided in Section 12. It shall be construed as practicing optometry for any person to prescribe, give directions or advise as to the fitness or adaptation of a pair of spectacles, eyeglasses or lenses for another person to wear for the correction or relief of any condition for which a pair of spectacles, eyeglasses or lenses are used.

Sec. 7. And be it enacted, That every person who is actually engaged in the practice of optometry in the State of Maryland at the time of the passage of this act shall within six months thereafter file an affidavit in proof thereof with the examining board in optometry, who shall make and keep a record of such person, and shall for the consideration of the sum of five dollars issue to him a certificate of registration. Recipients of said certificate shall within three months present the same for record in the city or county in which they reside, as provided for in this act, and shall pay a fee of fifty cents to the clerk for recording the same, and failure to present said certificate within three months after issuance thereof shall cause forfeiture of same.

Sec. 8. And be it enacted, That every person not exempt by Section 7 of this act, desiring to begin the practice of optometry in this state shall pass an examination before said board of examiners. Such examination shall be confined to such knowledge as is essential to the practice of optometry and shall include anatomy and physiology of the eye; all branches of optics as it applies to optometry; the use of the ophthalmoscope and all instruments used in a practical examination of the eye; also any subject the board may deem essential in the examination of an applicant. Any applicant for examination must not be under twenty-one years of age, and must be of good moral character, and must give evidence which shall be satisfactory to the board of examiners of having had preliminary education equal to the second year grade of a regular high school, and shall appear before the board at such time and place as the board may designate. Each person shall pay at the time of filing his application the sum of twenty dollars to the secretary of the board for the use of said board, and if he shall pass said examination he shall pay to the said secretary, for the use of said board, a further sum of five dollars on the issuance to him of a numbered certificate of examination which shall constitute a license to practice optometry. All persons passing such examinations shall be registered in the board register, which shall be kept by the secretary, and shall also receive a numbered certificate of such registration, signed by at least three members of the board making such examination of said applicant, which shall be recorded in the clerk's office of the superior court of Baltimore City, or the clerk's office of the circuit court of any county in the state. If an applicant be rejected he shall be entitled to another examination not earlier than six months thereafter for the fee first paid, but for subsequent examinations he shall pay a fee of fifteen

dollars. Said examinations are not to occur within six months of the preceding one.

Sec. 9. And be it enacted, That any person entitled to a certificate as provided for in Section 7 of this act, who shall not within six months after the passage thereof make written application to the board of examiners for a certificate of registration, accompanied by a written statement, signed by him and duly verified before an officer authorized to administer oaths within this state, fully setting forth the grounds upon which he claims such certificate, shall be deemed to have waived his right to a certificate under these provisions, or refusal on the part of any person holding such certificate under the provisions of such sections to file same for record as hereinbefore provided for three months after the issuance thereof, shall forfeit same.

Sec. 10. And be it enacted, That every person to whom a certificate of registration or examination is granted shall display the same in a conspicuous part of his office wherein the practice of optometry is conducted. Every person licensed to practice under this act shall deliver, whenever he may make an examination, prescribe or furnish spectacles, eyeglasses or lenses to any person outside of or away from his place of business, a statement which shall contain his home address, signature and number of his certificate of registration or examination.

Sec. 11. And be it enacted, That every registered optometrist who desires to continue the practice of optometry in this state shall annually on such date as the board of optometry may determine, pay to the secretary of said board a registration fee, to be fixed by them, but which shall not exceed the sum of five dollars per annum, for which he shall receive a renewal receipt. Should any optometrist fail to make application for a renewal of registration, he shall be notified that his certificate of registration will be revoked within thirty days after such notification, and if he fails to pay the annual fee before the expiration of the time mentioned in said notice said board may at once proceed to revoke said certificate of registration.

Sec. 12. And be it enacted, That recipients of certificates of registration or examination shall present the same to the clerk of the superior court of Baltimore City or to the clerk of the circuit court of the county in which they permanently reside, and shall pay a fee of fifty cents for recording same. Said clerk shall record said certificate in a book to be provided by him for that purpose. Any person so licensed removing his residence permanently from one county to another in this state shall, before engaging in the practice of optometry in such other county, obtain from the clerk of the county or city in which said certificate is recorded a certified copy of such record, or else obtain a new certificate of registration or examination from the board of examiners, and shall before commencing practice in such county or city present the same for record to the clerk of such county or city to which he removes, and pay the clerk thereof for recording same a fee of fifty cents. Any failure, neglect or refusal on the part of the person holding such certificate or copy of record to file same for record, as hereinbefore provided for three months after issuance thereof shall forfeit same. The board of examiners shall be entitled to a fee of one dollar for the reissuance of any certificate, and the clerk of any court

issuing the certified copy of such a certificate shall be entitled to a fee of one dollar for making and certifying a copy of the record of any such certificate.

Sec. 13. And be it enacted, That the board may revoke any certificate of registration or examination granted by it under this act because of wilful misrepresentation, illegal practice, conviction of crime, habitual drunkenness for six months preceding the charge, gross incompetency to practice optometry, and the board may refuse to grant a certificate any time of felony or gross immorality or addicted to the liquor or any time of foleny or gross immorality or addicted to the liquor or drug habit to such a degree as to render him unfit to practice the profession of optometry; but no certificate shall be revoked or refused unless written charges have been filed against the accused in person, and at least ten days' written notice of the time and place of the hearing thereon, which shall be public, served upon the accused, and he be given an opportunity to confront the witness against him, offer testimony in his own behalf and be heard in person or by counsel. Witnesses at such hearing shall testify under oath and the board may enforce the attendance of witnesses. The board may at any time after the expiration of ninety days from its revocation issue a new certificate to any one whose certificate has been revoked, when it is made to satisfactorily appear to the board that the disqualification has been removed or ceased to exist, upon payment of such fees as are herein provided. Any optometrist convicted a second time for violation of the provisions of this act or whose certificate of registration or examination has been revoked shall not be permitted to practice optometry in this state. An appeal may be taken from the action of the board refusing to grant or revoking a certificate for such causes to three disinterested optometrists, one of whom shall be appointed by said board, another of whom shall be appointed by the appellant, and the two so appointed to select the third, and the decision of any two thereof shall be final and binding. Thirty dollars shall be deposited with said board by said appellant prior to the selection of the three persons aforesaid for the purpose of defraying the expenses of said appeal. If the decision of the board be not affirmed, the said thirty dollars is to be returned to said appellant and the expenses of the appeal is to be borne by the board.

Sec. 14. And be it enacted, That it shall be unlawful for any person to knowingly sell to or prescribe glasses for persons with diseased eyes except it be with their knowledge and consent or on an order of or advice from a registered physician, or to sell to or prescribe concave glasses for a person under fifteen years of age except on an order of or advice from a registered physician. It shall not be construed as a violation of this section for a person to sell a duplicate or replace glasses for such cases cited in this section.

Sec. 15. And be it enacted, That any person who shall violate any of the preceding provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not more than one hundred dollars, or imprisoned not more than thirty days, or both fined and imprisoned, and his license may be revoked, in the discretion of the court.

Sec. 16. And be it enacted, That any person holding a license under

this act who shall attach to his name or use the title M. D., Surgeon, Doctor, Physician, Eye-Specialist, Oculist, Ophthalmologist, Doctor of Ophthalmology, Doctor of Optometry, Doctor or Optics, or any word or abbreviation that will or can convey the impression that he is engaged in the treatment of diseases or injuries of the human eye, or make use of drugs, medicine, or surgery in the practice of optometry, shall be guilty of a misdemeanor, and upon conviction thereof shall be fined not more than two hundred dollars, or imprisoned not more than three months, or both fined and imprisoned, and his license may be revoked, in the discretion of the court.

Sec. 17. And be it enacted, That the provisions of this act shall not apply nor be construed to apply to persons who sell spectacles, eyeglass or lenses as merchandise, or to opticians who furnish glasses on an order from an oculist, or to physicians and surgeons who are authorized to practice in this state, or to dealers in spectacles, eyeglasses or lenses who neither practice nor profess to practice optometry as defined in this act.

Sec. 18. And be it enacted, That this act shall take effect and be in force from and after its passage.

NEW JERSEY OPTOMETRY LAW.

1914.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

Section 1. The practice of optometry is hereby defined to be the employment of any means, other than the use of drugs, for the measurement of the powers of vision and the adaptation of lenses for the aid thereof.

Sec 2. There is hereby created a board to be known and styled the New Jersey State Board of Optometrists. Said board shall consist of five persons, who shall possess sufficient knowledge of theoretical and practical optics to practice optometry, and who shall have been residents of this state actually engaged in the practice of optometry for at least five years. The term of each member of said board shall be three years, or until his successor is appointed and shall have qualified, and vacancies shall be filled for the unexpired term only; but in the original appointment of the members of the board, two shall be appointed for the term of one year, two for two years and one for three years, from July 1, 1914. Said board shall be appointed by the governor of this state on or before July 1, 1914, and annually thereafter as vacancies occur in the membership of said board they shall be filled by the governor.

Sec. 3. The members of said board shall, before entering upon the discharge of their duties, and within 30 days after their appointment, take and subscribe to an oath before any officer authorized to administer oaths in this state, for the faithful performance of duty, and file the same with the secretary of state; they shall annually elect from their number a president and secretary, who shall also be treasurer, each of whom shall hold office for one year and until his successor shall have been duly elected and shall have qualified, the secretary and treasurer shall receive such compensation for his services as may be determined

by the board, and shall give a bond for the faithful performance of his duties, in such sum as the said board may determine.

Said board shall make such rules and regulations, not inconsistent with the law, as may be necessary for the proper performance of its duties; any member of the board may, upon being duly designated by the board, or a majority thereof, administer oaths or take testimony concerning any matter within the jurisdiction of the board; the board shall adopt a seal, and the secretary shall have the care and custody thereof, and shall keep a record of all the proceedings of the board, which shall be open to public examination.

Sec. 5. Provisions shall be made by the said board for holding examinations of applicants for registration to practice optometry, at least twice in each year, if there shall be any such applicants.

Sec. 6. Every person desiring to commence or to continue the practice of optometry after January 1, 1915, except as hereinafter provided, shall file with the secretary of the New Jersey state board of optometrists, upon blanks to be furnished by said secretary an application, verified by oath, stating therein that such applicant is more than 21 years of age, of good moral character, has a preliminary education equivalent to at least two years in a high school of this state, and has also studied at least three years in a registered optometrist's office, or has graduated from a school of optometry maintaining a standard satisfactory to said board, or has practiced as a registered optometrist for two full years outside of this state, and shall take an examination before said board to determine his qualifications therefor. If the examination of any applicant for registration shall be satisfactory to the majority of the board, he shall receive from said board a certificate of registration authorizing him to practice optometry, but any person who shall, prior to January 1, 1915, submit to the board satisfactory proof as to his character, competency and qualifications, and that he has been continuously engaged for more than two years next prior to the passage of this act, shall receive a certificate of registration which shall entitle him to practice optometry under this act. All examination papers shall be deposited in the state library in the Capitol building, and they shall remain there for a period of one year, at the expiration of which time they shall be destroyed, and they shall be *prima facie* evidence of all matters therein contained.

Sec. 7. The fee for such examination shall be \$15.00; for a certificate of registration, \$10.00; to be paid to the secretary of the board by the applicant upon filing his application and receiving his certificate, respectively, and constitute a fund for expenses made necessary by this act.

Sec. 8. Before any certificate is issued it shall be numbered and recorded in a book kept in the office of the board, and its numbers shall be noted upon the certificate. A photograph of the person registered shall be filed with the record. In all legal proceedings the record and photographs so kept in the office of the board, or certified copies thereof, shall be *prima facie* evidence of the facts herein stated.

Sec. 9. Every person to whom a certificate of registration shall be issued shall file the same, for the purpose of registration, with the clerk of the county in which he resides, and also with the clerk of each

other county wherein he shall then practice or thereafter commence the practice of optometry, and said clerk shall enter a memorandum thereof, giving the date of said certificate, with the name of the person to whom the same is issued, the number thereof, and the date of said filing, in a book to be kept by him for that purpose, and shall return said certificate to the owner thereof, and for which registry the said county clerk shall be entitled to demand and receive from each person registering the sum of \$1.00; and each county clerk in the counties of this state shall upon the last day of December of each year furnish to the secretary of the New Jersey state board of optometrists a list of all the certificates of said board filed as aforesaid in his office during the previous year, and upon notice to him of the change of location or death of the person registered, or of the revocation of said certificate, said county clerk shall enter at the appropriate place in the book so kept by him a memorandum of said fact.

Sec. 10. Every person practicing optometry must also display his certificate in a conspicuous place in the principal office wherein he practices optometry, and, whenever required, exhibit such certificate to said board or its authorized representatives. And whenever practicing said profession of optometry outside of or away from said office or place of business he shall deliver to each customer or person so fitted with glasses a bill of purchase which shall contain his signature, home postoffice address and the number of his certificate.

Sec. 11. The board shall have power to revoke any certificate of registration granted by it under the act, the holder of which is guilty of any fraud or deceit in his practice, has been convicted of crime, or is an habitual drunkard or grossly incompetent to practice optometry. Proceedings for revocation of a certificate shall be begun by filing with the New Jersey state board of optometrists a written charge or charges against the accused. These charges may be preferred by any person or corporation, or the board may, on its own motion, direct its secretary to prefer said charges.

Sec. 12. When charges are preferred the New Jersey state board of optometrists, or a majority thereof, shall hear and determine said charges. For such purpose the said board, or a majority thereof, shall have the powers of a court of record sitting in the county in which its meeting shall be held to issue subpoenas and to compel the attendance and testimony of witnesses. A time and place for the hearing of said charges, within the county in which the accused was last known to practice, shall be fixed by said board as soon as convenient, and a copy of the charges, together with a notice of the time and place when they will be heard and determined, shall be served upon the accused or his counsel at least twenty days before the date actually fixed for said hearing. The accused shall be entitled to the subpoena of the board for his witnesses. Where personal service or service upon counsel cannot be effected, and such fact is certified on oath, the board shall cause to be published for at least seven times, for at least twenty days prior to the hearing, in two daily papers in the county in which the optometrist was last known to practice, a notice to the effect that at a definite time and place a hearing will be held for the purpose of hearing charges against the optometrist upon an application to revoke his certificate.

At said hearing the accused shall have the right to cross-examine the witnesses against him and to produce witnesses in his defense, and to appear personally or by counsel.

Sec. 13. The said board shall reduce its findings to writing, to be signed by all the members who have heard said charges. If the board shall unanimously find that said charges, or any of them, are sustained, the board may thereupon, in its discretion, revoke said certificate of registration.

Sec. 14. If the board shall revoke such certificate it shall forthwith transmit to the clerk of the county or counties in which said accused is registered as an optometrist a certificate under its seal certifying that such certificate of registration has been revoked, and said clerk shall, upon receipt of said certificate, file the same and forthwith mark said registration "certificate revoked."

Sec. 15. No person shall practice optometry after his registration has been marked "certificate revoked."

Sec. 16. Any person whose certificate shall be refused or revoked by said board shall have the right to appeal by certiorari to the supreme court for a review of such action, and the supreme court is hereby authorized and empowered to review and correct the action of said board, and the said board shall forthwith carry out the judgment of the supreme court on such review.

Sec. 17. Where the certificate of registration of any person has been revoked, as herein provided, the board may, after the expiration of one year, entertain an application for a new certificate in like manner as original applications for certificates are entertained; and upon such new application it may, in its discretion, exempt the applicant from the necessity of undergoing an examination.

Sec. 18. The expense of said board and of the officers thereof, and of the examination held by said board, and of any other matter in connection with the provisions of this act, shall be paid from the registration fees above provided for. In no case shall any such expense be paid by the State of New Jersey or be a charge against said state.

Sec. 19. An itemized account of all the receipts and expenditures of said board shall be kept by its secretary and a detailed report thereof each year ending with the 30th day of November, duly verified by the affidavit of the said secretary, shall be filed with the secretary of state within ten days thereafter, the secretary of said state to be paid such fees therefor as are now paid for filing similar papers in his office.

Sec. 20. The members of the board shall be entitled to reimbursement for their traveling expenses incurred in pursuance of their duties, not to exceed \$10.00 per diem for each member of the said board.

Sec. 21. No person not a holder of a certificate duly issued to him and filed as above provided shall, after January 1, 1915, practice optometry within this state. No person shall falsely personate a registered optometrist of a like or different name, nor buy, sell or fraudulently obtain a certificate issued to another. Practicing or offering to practice optometry, or the public representation of being qualified to practice the same by any person not authorized to practice optometry, shall be sufficient evidence of a violation of this act.

Sec. 22. Any violation of the provisions of this act shall be a mis-

demeanor, and shall be punished by a fine of not less than \$50.00 nor more than \$200.00, or by imprisonment for not less than 30 days, or not more than six months, or by both fine and imprisonment.

Sec. 23. Nothing in this act shall be construed to apply to duly licensed physicians authorized to practice medicine under the laws of the State of New Jersey, nor to persons who neither practice nor profess to practice optometry, who sell spectacles, eyeglasses or lenses either on prescription from such physician or from duly qualified optometrists, or as merchandise from permanently located and established places of business.

Sec. 24. Nothing contained in this act shall authorize, empower or confer upon any person practicing optometry the right to add, affix or attach to his or her name the title, designation, character or letters of M. D., surgeon, doctor, ophthalmologist, or to indicate in any way that he or she is engaged in the treatment of injuries of the human eye, or to use any therapeutic measures or agencies other than glasses for the treatment of the human eye, except he or she is authorized to do so by the board, body or persons now empowered by law to award such right or title; provided, however, that any person violating the provisions hereof shall be guilty of a misdemeanor.

Sec. 25. This act shall take effect immediately.

OREGON OPTOMETRY LAW.

1914.

Section 1. That practice of optometry is defined as follows, namely: The employment of subjective and objective mechanical means to determine the accommodative and refractive states of the eye and the scope of its functions in general.

Sec. 2. It shall be unlawful for any person to practice optometry, or to profess by public advertisement, sign, circular or card to practice optometry, in the State of Oregon, unless such person shall first have obtained a certificate of registration and filed the same, or a certified copy thereof, for record with the clerk of the county in which such person shall practice, as hereinafter provided.

Sec. 3. There is hereby created a board whose duty it shall be to carry out the purposes and enforce the provisions of this act, and which shall be styled the Oregon state board of examiners in optometry. The present members of said board shall continue in office until the thirty-first day of April, 1909, and until their successors are appointed and qualified. Appointments to fill vacancies caused by death, registration or removal, shall be made for the residue of the term by the governor. All appointments to said board after the expiration of the terms of the present members of the said board shall be as follows: It shall be the duty of the Oregon State Association of Optometrists at the regular meeting of said association, next prior to the time of appointment by the governor of said members, to furnish to the governor the names of three competent optometrists for each member to be appointed and from which he shall select the appointees to fill said offices. The terms of office of each of the three members of said board, first appointed after the expiration of the terms of the present members thereof, shall be, respectively, one for one year, one for two years, and one for three years, to be designated by the governor at the time of

their appointment and thereafter each term of office shall be for three years, and all members shall hold office until their successors are appointed and qualified. No person shall be eligible to membership on said board who is connected, either directly or indirectly, with the wholesale optical business, and who is not engaged in the actual practice of optometry, a citizen of the United States, and a resident of the State of Oregon. The members, before entering upon their duties, shall respectively take and subscribe an oath or affirmation substantially to the effect that he will support the Constitution and laws of the United States and of the State of Oregon, and will faithfully perform the duties of the office of a member of the Oregon state board of examiners in optometry; said oath or affirmation to be filed with the clerk of the county in which such member resides. The said board shall have a common seal.

Sec. 4. Said board shall choose at its first regular meeting, and annually thereafter, one of its members president and one secretary thereof, who, severally, shall have the power during their term of office to administer oaths and take affidavits, certifying thereto under their hand and the seal of the board. Said board shall meet at least once in each year at the State Capitol, and in addition thereto whenever and wherever the president and secretary thereof shall call a meeting; a majority of said board shall at all times constitute a quorum. The secretary of said board shall keep a full record of the proceedings of said board, which record shall at all reasonable times be open to public inspection.

Sec. 5. Every person desiring to commence the practice of optometry in this state must show by satisfactory evidence, certified by oath, that he is more than 21 years of age, of good moral character, has a preliminary education equivalent to at least two years in a registered high school and has also studied at least three years in a registered optometrist's office, or has graduated from a school of optometry, maintaining a standard satisfactory to the said board of examiners, shall take an examination before said board of examiners to determine his qualifications therefor. Such examination shall be confined to such knowledge as is essential to the practice of optometry. Any person having signified to said board his desire to be examined by them and having filed the said proof shall appear before them at such time and place as they may designate, and before beginning such examination shall pay to the secretary of said board for the use of said board, the sum of \$10.00, and if he shall successfully pass such examination, shall be registered by said board as possessing the qualifications required by this section, and shall receive from said board a certificate thereof. All persons successfully passing such examination shall be registered in the board register, which shall be kept by said secretary, as licensed to practice optometry and shall also receive a certificate of such registration to be signed by the president and secretary of said board, which shall be filed as hereinbefore provided: Provided, however, that the further sum of \$5.00 shall be paid by the said person to said secretary for the use of said board upon the issuance of said certificate of registration.

Sec. 6. Every person who is actually engaged in the practice of optometry in the State of Oregon at the time of the passage of this

act shall within three months thereafter file an affidavit in proof thereof with said board, who shall make and keep record of such person and shall in consideration of the sum of \$5.00 issue to him a certificate of registration.

Sec. 7. All persons entitled to a certificate of registration under the full provisions of Section 6 shall be exempt from the provisions of Section 5 of this act.

Sec. 8. Recipients of such certificates of registration shall, before engaging in the practice of optometry in any county in this state, present the same for record to the clerk of such county and shall pay a fee of 50 cents to the clerk for recording the same. Said clerk shall record said certificate in a book to be provided by him for that purpose. Any person so licensed desiring to practice in any other county in this state shall, before engaging in the practice of optometry in such other county, present such certificate to the clerk of such other county for record or obtain from the clerk of the county in which said certificate of registration is recorded a certified copy of such record, or else obtain a new certificate of registration from the said board of examiners, and shall, before commencing practice in any other county, file the same for record with the clerk of such county and pay the clerk thereof for recording the same a fee of 50 cents. Such board shall be entitled to a fee of \$1.00 for the reissue of any certificate, and the clerk of any county shall be entitled to a fee of \$1.00 for making and certifying a copy of the record of any such certificate.

Sec. 9. Any person entitled to a certificate as provided in Section 6 of this act, who shall not within three months after the passage thereof make written application to the board of examiners for a certificate of registration, accompanied by a written statement signed by him, and duly verified before an officer authorized to administer oaths within this state, fully setting forth the ground upon which he claims such certificate, shall be deemed to have waived his right to a certificate under the provisions or the refusal on the part of any person holding such certificate under the provisions of this act. Any failure, neglect or refusal on the part of any person holding such certificate to file the same for record, as hereinbefore provided, for six months after the issuance thereof, shall forfeit the same.

Sec. 10. Every person to whom a certificate of examination or registration is granted shall display the same in a conspicuous part of his office wherein the practice of optometry is conducted.

Sec. 11. Out of the funds coming into the possession of said board each member thereof may receive, as compensation, the sum of \$5.00 for each day actually engaged in the duties of his office, and mileage at three cents per mile for all distance necessarily traveled in going to and coming from the meetings of the board. Said expenses shall be paid from the fees and assessments received by the board under the provisions of this act, and no part of the salary or other expenses of the board shall ever be paid out of the state treasury. All moneys received in excess of per diem allowance and mileage as above provided for shall be held by the secretary as a special fund for meeting expenses of said board and carrying out the provisions of this act, and he shall give such bond as the board shall from time to time direct, and the said

board shall make an annual report of its proceedings to the governor on the first Monday in January of each year, which report shall contain an account of all moneys received and disbursed by them pursuant to this act.

Sec. 12. Every registered optometrist who desires to continue the practice of optometry in this state shall annually, on such date as the board of optometry may determine, pay to the secretary of said board a registration fee to be fixed by the board, but which shall in no case exceed the sum of \$2.00 per annum, for which he shall receive a renewal of said registration; and in case of default in such payment by any person, his certificate may be revoked by the board of examiners, under twenty days' notice of the time and place of considering such revocation. But no certificate shall be revoked for such nonpayment, if the person so notified shall pay before or at such time of consideration his fee and such penalty as may be imposed by said board; provided, that said board impose a penalty of \$5.00 and no more on any one person so notified, as a condition of allowing his certificate to stand; provided, further, that said board of examiners may collect any such fees by suit.

Sec. 13. The board shall have power to revoke any certificate of registration granted by it under this act, if the holder of which is guilty of any fraud or deceit in his practice, has been convicted of a crime, or is an habitual drunkard, or grossly incompetent to practice optometry. Proceedings for revocation of a certificate or the annulment of registration shall be begun by filing a written charge or charges against the accused. These charges may be preferred by any person or corporation, or the board may on their own motion direct their executive officer to prefer said charges. Said charges shall be filed with the secretary of the board of optometry. A time and place for the hearing of said charges shall be fixed by said board as soon as convenient and a copy of the charges, together with a notice of the time and place when they will be heard and determined, shall be served upon the accused at least ten days before the date actually fixed for said hearing. Where personal service cannot be effected and such fact is certified on oath by any person duly authorized to make legal service, the board shall cause to be published for at least seven times, for at least twenty days prior to the hearing, in two newspapers in the county in which the optometrist was last known to practice, a notice to the effect that at a definite time and place a hearing will be had for the purpose of hearing charges against the optometrist upon an application to revoke his certificate. At said hearing the accused shall have the right to cross-examine the witness against him and to produce witnesses in his defense, and to appear personally or by counsel, or both. The said board shall make a written report of its findings and recommendations, to be signed by all its members, and the same shall be forthwith filed with the secretary of said board. If the committee shall unanimously find that said charges, or any of them, are maintained, and shall unanimously recommend that the certificate of the accused be revoked, or his registration be annulled, the secretary of said board shall revoke said certificate or annul said registration, or do both. If the secretary shall revoke said certificate or annul such registration he shall forth-

with transmit to the clerk of the county or counties in which said accused is registered as an optometrist, a certificate under seal of the board certifying that such registration has been annulled and said clerk shall, upon receipt of said certificate, file the same and forthwith mark said registration "Annulled." Any person who shall practice optometry after his registration has been marked "Annulled" shall be deemed to have practiced optometry without registration. Where the certificate of any person has been revoked, or his registration has been annulled as herein provided, the board may, after the expiration of ninety days, entertain an application for a new certificate, in like manner as original applications for certificates are entertained, and upon such new application they may in their discretion exempt the applicant from the necessity of undergoing an examination.

Sec. 14. Any person who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than \$20.00 nor more than \$100.00, or to be confined not less than one month nor more than three months in the county jail, and in default of payment of said fine shall be imprisoned in the county jail at the rate of one day for every \$2.00 of the fine so imposed. And all fines thus received shall be paid to the common school fund of the county in which such conviction takes place.

Sec. 15. Justices of the peace and the respective municipal courts have jurisdiction of violation of this act. It shall be the duty of the respective district attorneys to prosecute all violations of this act.

Sec. 16. Nothing in this act shall be construed to apply to physicians and surgeons authorized to practice under the laws of the State of Oregon, nor to persons who sell spectacles or eyeglasses in the ordinary course of trade, and who do not attempt to employ subjective and objective mechanical means, to determine the accommodative and refractive states of the eye.

Sec. 17. This act shall take effect and be in force from and after its passage.

Filed in the office of the secretary of state, February 21, 1905-1907-1911.

ILLINOIS OPTOMETRY LAW.

1915.

Section 1. Be it enacted by the people of the State of Illinois, represented in the General Assembly: That the practice of optometry is defined to be the employment of any means other than the use of drugs, medicine, or by surgery for the measurement of the power of vision and the adaptation of lenses for the aid thereof.

Sec. 2. The provisions of this act shall not be construed to apply to physicians duly licensed to practice medicine under the laws of the state, nor to persons who sell spectacles or eyeglasses on prescription from any duly qualified optometrist registered under this act or from any licensed physician, nor to dealers in spectacles or eyeglasses having an established place of business who neither practice nor profess to practice optometry, nor to the exclusively wholesale business of any dealer or manufacturer.

Sec. 3. The governor, with the advice and consent of the Senate, shall appoint five persons from among such practicing optometrists of

the state as have had not less than five years' practical experience in optometry, as defined in Section 1 of this act, who shall constitute the state board of optometry, no member of any optical school or college, or instructor in optometry, or person connected in any way therewith, or any manufacturer, jobber or jobbing representative, shall be eligible to appointment upon the state board of optometry. "On or before the first day of January, 1916, the governor shall appoint members of said board, and the terms of office for the said board first appointed shall be as follows: Beginning January 1, 1916, one member shall be appointed for a term of one year, one for two years, one for three years, one for four years, one for five years. The term of the members of said board, successively, shall expire on the 31st day of December of each year, and the terms of all members after the first board is appointed shall be for a period of five years and until their successors shall be appointed and qualified." If any person so appointed shall discontinue the active practice of optometry during the period of his appointment his term shall thereupon cease and he shall be at once removed by the governor. All vacancies, however, occurring shall be filled by appointment by the governor, with the advice and consent of the Senate, and appointments made when the Senate is not in session shall be confirmed at its next ensuing session.

Sec. 4. The members of the state board of optometry before entering upon the discharge of their duties shall make and file with the secretary of state the constitutional oath of office. The members of said board shall, within thirty days after appointment, and annually thereafter in the month of January, meet and organize by electing a president from among the members thereof, and a secretary, who shall also be the treasurer of said board, who shall not be a member of said board, but who shall have all the qualifications of a member. The said secretary and treasurer, before entering upon his duties, shall file a bond with the secretary of state in the penal sum of \$10,000, payable to the people of the State of Illinois, to insure the faithful discharge of his duties in said office. The said board shall prescribe the duties of its officers and adopt rules and regulations, not inconsistent with this act, to govern its proceedings; and also shall adopt a seal, and the secretary shall have the care and custody thereof, and he shall keep the record of all of the proceedings of said board, which shall be open at all times to public scrutiny. All certificates issued by the state board of optometry shall be signed by the president and attested by the secretary with the seal of said board attached to or impressed thereon. Every such certificate shall be prima facie evidence of the right of the holder to practice optometry. The president and secretary shall have power to administer oaths and the board to take testimony in all matters relating to its powers and duties, and for that sake thereof shall be able to compel the attendance of witnesses and the production of all necessary books, papers or documents, upon the proper service of a subpoena in proper form, duly attested.

Sec. 5. It shall be the duty of the board to examine all applications for registration submitted in proper form; to grant certificates of registration to such persons as may be entitled to the same under the provisions of this act; to cause the prosecution of all persons violating its

provisions; to report annually to the governor the condition of optometry in the State of Illinois, which said report shall also furnish a record of the proceedings of the board for the year and an itemized statement of all moneys received and disbursed, with the names of all optometrists registered under this act, and shall contain a copy of all rules adopted by said board of optometry, and to do all other things necessary to carry out the provisions of this act.

Sec. 6. The board shall have the power to make by-laws for the proper fulfillment of its duties under this act and shall keep a book of registration in which shall be entered the names and places of practice or business of all persons registered under this act, which book shall also specify such facts as said persons shall claim to justify their registration. The president of the board may call a special meeting at any time. Three members shall constitute a quorum and the records of the board shall at all times be open to public inspection.

Sec. 7. The board shall hold meetings for the examination of applicants for registration and the transaction of such other business as shall pertain to its duties at least once in three months, one of which meetings in every year shall be held in the city of Chicago and one in the city of Springfield; it shall give thirty days' public notice of the time and place of all such meetings.

Sec. 8. The secretary of said board shall receive a salary which shall be fixed by the board, but which shall not exceed the sum of fifteen hundred dollars per annum, payable quarterly out of the state treasury, on the warrant of the auditor of public accounts, out of any money which may from time to time be appropriated to pay the salaries of the officers of the state government. Each member of the board shall receive as compensation for his services the sum of seven dollars for each day engaged in this service and all legitimate and necessary expenses incurred in attending the meetings of the board, payable out of the state treasury on the warrant of the auditor of public accounts, out of any money which may from time to time be appropriated to pay the salaries of the officers of the state government, said warrant to be based upon vouchers certified to as correct by three members of the said board, and approved by the governor.

All moneys payable under this act shall be paid to the secretary, who shall pay them into the state treasury monthly.

Sec. 9. Any person who shall within three months after this act takes effect, forward to the state board of optometry an application for registration, accompanied by satisfactory proof that he was continuously engaged in the practice of optometry at an established place of business or practice for three years next preceding the date this act takes effect, shall, upon the payment of a fee of five dollars, be granted a certificate of registration as registered optometrist without examination. Provided, that in case of failure or neglect to register within three months' time limit as herein provided, such person shall be deemed to have waived his right to registration under this section, and in order to be registered shall comply with the requirements for registration by examination.

Sec. 10. Any person of good moral character, temperate habits and not less than twenty-one years of age, who shall present satisfactory

evidence to the state board of optometry that he has studied not less than two years in the office of a registered optometrist or that he has graduated from a school of optometry maintaining a standard satisfactory to the board, shall be entitled to an examination before said board for a certificate of registration upon making application, in such manner and form as shall be prescribed by the board, accompanied by the fee hereinafter specified. If the said examination shall be satisfactory to the board as to the qualifications of the applicant for the practice of optometry he shall be granted the certificate of registration by examination.

Sec. 11. Every such applicant for registration by examination shall pay to the secretary of the board at the time of filing his application a fee of ten dollars, which, if he does not pass the examination, shall also entitle him to a second examination if taken within one year. Should the second examination be satisfactory, he shall, before a certificate is granted, pay an additional fee of five dollars.

Sec. 12. The said board may, in its discretion, upon payment of a fee of five dollars, grant certificates of registration to the licentiates by examination of such other boards as shall prescribe similar recognition of its licentiates.

Sec. 13. Every person to whom a certificate of registration is granted under this act shall display the same in a conspicuous place in his principal office, place of business or employment. Any person violating the provision of this section shall be liable on conviction thereof to pay a fine of fifty (\$50.00) dollars.

Sec. 14. The state board of optometry may refuse to grant a certificate of registration to any person guilty of felony, gross immorality or malpractice, or who has an infectious or contagious disease, or is a victim to the use of alcoholic liquors or narcotic drugs to such an extent as to render him unfit for the practice of optometry; and the said board may, after due notice and hearing, revoke or suspend any certificate for like cause or any certificate procured by misrepresentation or fraud.

Sec. 15. Every registered optometrist who desires to continue the practice of optometry shall annually, on such date as the state board of optometry may determine, pay to the secretary of the board a renewal registration fee to be fixed by the board, but which shall in no case exceed two dollars per annum, for which he shall receive a renewal of his certificate.

In case of neglect to pay the renewal registration fee herein specified for any certificate within the time prescribed by the said board, the board may revoke such certificate and the holder thereof may be reinstated only by complying with the conditions specified in this act for the registration of unregistered persons. But no certificate or permit shall be revoked without giving sixty days' notice to the delinquent who, within such period, shall have the right of renewal of such certificate on payment of the renewal fee with such penalty, not exceeding twenty-five dollars, as said board may determine. Provided, that retirement from practice for a period not exceeding five years shall not deprive the holder of said certificate of the right to renew his certificate on the payment of all lapsed fees.

Sec. 16. Every renewal certificate issued by the state board of optometry under this act shall expire each year on the 31st day of December following the issuance of the same.

Sec. 17. It shall be unlawful on and after three months, from the date that this act takes effect, for any person to practice, or to profess or advertise to practice, optometry, or to test and examine eyes and recommend glasses therefor, unless he shall first have obtained a certificate from the state board of optometry as hereinbefore provided. Any person who shall violate any provision of this section shall be liable upon conviction thereof to pay a fine of not less than twenty-five dollars nor more than one hundred dollars for every such offense.

Sec. 18. It shall be unlawful for any person, not a registered optometrist, to open or conduct a store, shop, office or other place of business, where eyes are tested and spectacles or eyeglasses are recommended and sold, unless such person shall employ and place in active and personal charge thereof a registered optometrist.

It shall be unlawful for the proprietor of any store, shop, office, or place of business, as aforesaid, to allow any person in his employ to examine and test the eyes of another and to recommend glasses therefor unless such person shall be a registered optometrist.

Any person violating any provision of this section shall be liable upon conviction thereof to pay a fine of not less than twenty-five dollars nor more than one hundred dollars for every such offense.

Sec. 19. Every person registered under this act shall cause his original certificate or permit to be registered with the county clerk of each and every county in which he shall practice, and the date of registration shall be endorsed thereon. And whenever practicing said profession of optometry outside of, or away from, his principal office or place of business, he shall deliver to each customer or person he shall fit with glasses a bill of purchase bearing the date thereof, which shall contain his signature, home postoffice address and the number of his certificate or registration. The clerk of the county may charge a registration fee not exceeding twenty-five cents for every such certificate. For failure or neglect by the holder to register any certificate as provided in this section the state board of optometry may revoke the same, subject to reinstatement only on payment to the said board of a penalty of not less than twenty-five dollars nor more than one hundred dollars.

Sec. 20. All suits for the recovery of the penalties prescribed in this act, shall be prosecuted in the name of the "People of the State of Illinois," in any court having jurisdiction and it shall be the duty of the state's attorney of the county where such offense is committed to prosecute all persons violating the provisions of this act upon proper complaint being made. All penalties collected under the provisions of this act shall inure to the state board of optometry and by them be turned over to the state treasurer, with the regular report.

ARKANSAS OPTOMETRY LAW.

1915.

Be It Enacted by the People of the State of Arkansas:

Be It Enacted by the General Assembly of the State of Arkansas:

Section 1. The practice of optometry is defined to be the employ-

ment of any means, other than the use of drugs, medicine or surgery, for the measurements of the powers of vision. The employment of tests for examinations for the determination of the natural and functional deficiencies of the eye, and the adaptation of lenses for the aid thereof.

Sec. 2. A state board of optometry is hereby created, which shall consist of five regular optometrists who are members of the Arkansas Optometric Association, and who have been engaged in the regular practice of optometry in this state for a period of three years. Before entering upon their duties they shall take the oath prescribed for state officers, which oath shall be filed with the secretary of state. They shall be appointed by the governor, and shall hold office, one for one year, one for two years, one for three years, one for four years, and one for five years, and until their successors are appointed and qualified. Their successors shall possess like qualification and shall be appointed by the governor, each for a period of five years, and all vacancies shall be filled by appointment by the governor.

Sec. 3. The board, at its first regular meeting, and annually thereafter, shall elect one of its members as president, and one as secretary and treasurer. The board may administer oath for this purpose. A record of its proceedings shall be kept, and shall be opened at all reasonable times to public inspection. The board shall meet at least twice a year, the time and place of meeting to be designated by the president, five days' notice of which shall be given to the members by the secretary. A majority of the board shall constitute a quorum.

Sec. 4. Three months after the passage and approval of this act, except as otherwise provided herein, no person shall practice optometry as defined in section 1 of this act until he shall have passed an examination conducted by the board, in theoretic, practical and physiological optics, theoretic and practical optometry, and in the anatomy and physiology of the eye, and shall have been registered and shall have received a certificate of registration, which certificate shall have conspicuously printed upon its face the definition of optometry as defined in section 1. Every applicant for examination shall present satisfactory evidence that he is over twenty-one years of age, of good moral character, has a preliminary education equivalent to at least two years in a public high school and has also studied the subjects herein prescribed for at least two years, or has graduated from a school of optometry maintaining an attendance course of study of not less than two years; but any person actually engaged in the practice of optometry in this state at the time of the passage and approval of this act shall be entitled to take such examination merely upon proof satisfactory to the board that he is of good moral character. Any person who has been actually engaged in the practice of optometry in this state for one year preceding the date of the passage of this act may continue in such practice for a period of two years from the approval of this act without taking the said examination and without the said certificate; provided, that he shall, on or before three months after the approval of this act, file with the board an affidavit, stating his name, place of business, and the date of his commencing such practice, the affidavit to be signed by two reputable citizens, certifying

as to his character and business standing, and to be satisfactory to the board. The affidavit, if accepted, shall be recorded by the board. Any person whose affidavit has been so accepted and recorded and who is in the actual practice shall, before the expiration of said period of two years, if he desires to continue in such practice thereafter, present himself before said board for examination in practical optics, and if the board is satisfied of his competency to practice optometry, he shall be registered and receive his certificate as aforesaid, upon his paying a fee of \$10.00 to the board. The original appointees to the board of registration shall be entitled to certificates of registration by virtue of their appointment, without examination.

Sec. 5. The board shall, at the request of applicants for examination, meet at such times and places as it may deem reasonable. Each applicant shall deposit the sum of \$15.00 with the treasurer of said board, \$5.00 of which shall be returned to the applicant if he fails to pass a satisfactory examination. The board shall keep minutes of its meetings, which shall show, among other things, the name of each person examined, the result of examination and action of the board thereon.

Sec. 6. Each member of the board shall receive \$5.00 for each day of actual service, with mileage at the rate of three cents per mile for the distance necessarily traveled in going to and returning from the place of the meeting. Such remuneration shall be paid exclusively from the fees collected by the board. On the first day of January of each year the board shall submit a report to the governor, showing, among other things, the names and addresses of applicants licensed during the year, and the receipts and disbursements of the board. A treasurer of the board shall execute a bond for the state in the penal sum to be fixed by the board conditioned for the faithful performance of the duties of his office.

Sec. 7. The board shall have the power to revoke any certificate or license, or to suspend the same for fraud or deceit or for conviction of crime or for habitual drunkenness, or for gross incompetency; provided, however, that before any certificate shall be revoked, the holder thereof shall have written notice of the charge or charges made against him, and the day specified in said notice, at least five days after the service thereof, at which a public hearing is to be given, where the accused shall have an opportunity to produce testimony in his own behalf and to confront the witnesses against him. Three of the members of the board shall be a quorum for such hearing.

Sec. 8. It shall be unlawful for any one to practice optometry without first having his license, or a certified copy thereof, registered in the office of the circuit clerk of each county in which he practices. For the filing of said license the clerk shall receive a fee of fifty cents, and he shall record the same in a book by him kept for that purpose.

Sec. 9. Every registered optometrist shall annually pay to the treasurer of the board the sum of \$2.00 as a license fee for such year, which shall be made on or before the first day of January following the year of the granting of the license, and in case of default of such payment by any person so registered, his certificate may be revoked by the board upon thirty days' notice by said board.

Sec. 10. All fees collected from applicants for license to practice optometry and from applicants for renewal license shall be paid to treasurer of this board and same shall be used by said board for the purpose of prosecuting violators of this act and to defray the official expenses of the board.

Sec. 11. No person not a holder of a certificate of registration or other certificate duly issued to him and recorded as herein provided shall three months after the passage of this act, practice optometry in this state. No person shall falsely impersonate a registered optometrist of a like or different name, nor buy, sell or fraudulently obtain a certificate of registration issued to another person practicing or offering to practice optometry, or the public representation of being qualified to practice the same by any person not authorized to practice optometry, shall be sufficient evidence of the violation of this act. Any person violating this act shall be deemed guilty of a misdemeanor, and upon conviction shall be punished by fine of not less than \$25.00 or more than \$200.00, or imprisonment in the county jail not more than three months, or both.

Sec. 12. Nothing in this act shall be construed to apply to physicians and surgeons authorized to practice under the laws of Arkansas, nor to persons who neither practice nor profess to practice optometry, or who sell spectacles, eyeglasses or lenses, either on prescription from such physicians, surgeons or optometrists, or as merchandise at regular established places of business, or to veterans of the Civil War.

Sec. 13. This act, being necessary for the public peace, health and safety, shall take effect and be in force from and after its passage, and all laws and parts of laws in conflict herewith are hereby repealed.

PENNSYLVANIA OPTOMETRY LAW.

1915.

An act to regulate the practice of optometry in Pennsylvania, defining optometry and relating to the right to practice optometry in the Commonwealth of Pennsylvania and making certain exceptions and providing a bureau of optometrical education, examination and licensure as a bureau of the department of public instruction and means and methods whereby the right to practice optometry may be obtained, and providing for the means to carry out the provisions of this act, and providing for revocation or suspension of licenses given by said bureau, and providing penalties for violations thereof and repealing all acts or parts of acts inconsistent therewith.

Whereas, the eyesight of the citizens of this commonwealth is endangered by incompetent persons practicing optometry and due regard for the safety and protection of the citizens demand that only authorized and qualified optometrists shall be permitted to practice optometry.

Section 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in general assembly met, and it is hereby enacted by the authority of the same, That the practice of optometry is hereby defined to be the employment of any means other than the use of drugs for the measurement of the powers of vision and the adaptation of lenses for the correction and aid of the vision of human beings.

Sec. 2. That on and after January 1, 1916, it shall not be lawful for

any person in this commonwealth to engage in the practice of optometry or to hold himself out as a practitioner of optometry or to attempt to determine by an examination of the eyes the kind of glasses needed by any person or to hold himself out as a licensed optometrist when not so licensed or to hold himself out as able to examine the eyes of any person for the purpose of fitting the same with glasses excepting those hereinafter exempted unless he has first fulfilled the requirements of this act and has received a certificate of licensure from the bureau of optometrical education, examination and licensure created by this act, nor shall it be lawful for any person in this commonwealth to represent that he is the lawful holder of a certificate of licensure such as is provided for in this act when in fact he is not such lawful holder, or to impersonate any licensed practitioner of optometry or to fail to deliver the certificate provided for in section six of this act.

Any person violating the provisions of this section shall be deemed guilty of a misdemeanor and shall upon conviction be subject upon first offense to a fine of not more than five hundred dollars or imprisonment for not more than six months in the county prison, or both or either at the discretion of the court, and upon conviction on second or later offense shall be subject to a fine of not less than five hundred dollars nor more than one thousand dollars and imprisonment for not less than six months nor more than one year at the discretion of the court.

Sec. 3. For the purpose of carrying out and enforcing the provisions of this act there shall be established in this commonwealth a bureau of the department of public instruction which shall be known as the bureau of optometrical education, examination and licensure of the department of public instruction of the Commonwealth of Pennsylvania. The said bureau shall consist of seven members, one of whom the superintendent of public instruction shall be ex-officio a member thereof; the six remaining members shall be appointed by the governor of the commonwealth on or before September 1st, 1915. Each member shall receive a certificate of his appointment signed by the governor and attested by the secretary of the commonwealth. Only optometrists, citizens of this commonwealth who possess the requisite qualifications to practice optometry under this act, and who shall have been so practicing in this state during the five years next previous to their appointment, shall be eligible to appointment. The appointment of members of said bureau shall be made from the list of members of the optical society of the State of Pennsylvania submitted to the governor by the executive committee of said society, and future appointments from a similar list submitted annually by said committee. Two members of the bureau first appointed under this act shall serve for one year, two for two years and two for three years, after which the successor of each member shall be appointed for the term of three years, but no member of said bureau shall be a member of the faculty of any undergraduate school or college teaching optometry. The first appointees shall, by virtue of such appointment, receive certificates of licensure without examination. The governor shall, by appointment, fill all vacancies caused by death, resignation or otherwise, and may remove any member of said bureau for continued neglect of his duties in connection therewith or for any unprofessional or dishonorable conduct, but only upon due proof of such

neglect or unprofessional or dishonorable conduct and after an opportunity has been given such member for a hearing. Appointments to fill vacancies occurring through death, resignation, or otherwise shall be for the unexpired term of the deceased or retiring member.

Sec. 4. Said bureau shall effect its organization immediately after the appointment of its members by the governor by holding a meeting at which it shall elect from its membership a president and secretary, who shall also be treasurer. It shall have authority to make rules and regulations not inconsistent with the laws of this commonwealth for the transaction of its business and for the registration of all optometrists of this commonwealth and for conducting examinations of applicants. Said rules shall be printed in pamphlet form for public distribution and may be published in such newspapers in Philadelphia, Pittsburgh and Harrisburg as may be designated by the bureau. Five members shall constitute a quorum for the transaction of all business except for the consideration of the revocation or suspension of a certificate of licensure or the refusal to grant a certificate of licensure or the determination of the fitness of any college to render eligible its graduates for licensure when the unanimous consent of all seven members shall be necessary. Said bureau shall meet at least twice a year at Harrisburg. Any member may administer oaths and take testimony when appointed so to do by the bureau. The appointed members shall receive compensation at the rate of ten dollars per day and necessary expenses for each day actually devoted to the work of the bureau, and the superintendent of public instruction shall receive two hundred and fifty dollars per annum as compensation for his services as a member of the bureau.

Sec. 5. Every person desiring to commence the practice of optometry or if now in practice to continue the practice thereof after January 1st, 1916, except as herein otherwise provided, shall take the examination provided in this act and satisfy the other requirements hereof as herein provided. Any person who has been engaged in the practice of optometry in this commonwealth for two full years prior to the passage of this act or for one year in this and for the year preceding it in another state, and is of good character, and shall be entitled to take a limited examination covering the following matters only:

- (a) The limitations of the sphere of optometry.
- (b) The necessary scientific instruments used.
- (c) The form and power of lenses used.
- (d) A correct method of measuring presbyopia, hypermetropia, myopia and astigmatism.
- (e) The writing of formulas or prescriptions for the adaptation of lenses in aid of vision.

Any person over the age of twenty-one years, of good moral character, who has had a preliminary education equivalent to two years of the course of a high school whose standard is approved by the department of public instruction, which preliminary education shall be ascertained by examination or by acceptable certificate as to credits for work done in such approved institution and has graduated from a school of optometry approved by said bureau, which maintains a course in optometry of not less than (two) years, and has afterwards studied optometry for at least one year in a licensed optometrist's office, shall be

entitled to take a standard examination. Said standard examination shall consist of tests in practical, theoretical and physiological optics in theoretical and practical optometry and in the anatomy and physiology of the eye and in pathology as applied to optometry. Provided, however, that any person not less than twenty-one years of age, who is actually engaged in the practice of optometry at the time of the passage of this act shall be entitled to take the standard examination merely upon proof to the bureau that he is of good moral character and is not addicted to the intemperate use of alcohol or narcotic drugs.

Sec. 6. Every person desiring to be licensed as in this act provided shall file with the secretary of said bureau upon appropriate blanks to be furnished by said secretary an application verified by oath setting forth the facts which entitle the applicant to examination and licensure under the provisions of this act. The said bureau shall hold at least two examinations each year. In case of failure at any standard examination the applicant after the expiration of six months and within two years shall have the privilege of a second examination by the bureau without the payment of an additional fee. In case of failure at any limited examination the applicant shall have the privilege of continuing the practice of optometry and of taking a second and third examination without the payment of an additional fee. But in the event of his failing to pass the examination on or before January 1st, 1917, he shall thereafter cease to practice optometry in this commonwealth. Every applicant who shall pass the standard examination or the limited examination as the case may be, and who shall otherwise comply with the provisions of this act, shall receive from the said bureau under its seal a certificate of licensure entitling him to practice optometry in this commonwealth, which certificate shall be duly registered in the office of the superintendent of public instruction of this commonwealth in a record book to be properly kept for that purpose, which shall be open to public inspection, and a duly certified copy of said record shall be received as evidence in all courts of this commonwealth in the trial of any case. Each person to whom a certificate shall be issued by said bureau shall keep said certificate displayed in a conspicuous place in the office or place of business wherein said person shall practice optometry, together with the photograph of said person attached to the lower right hand corner of said certificate, and shall whenever required exhibit the said certificate to any member or agent of said bureau. Whenever any such person shall practice optometry outside or away from his office or place of business, he shall deliver to each person fitted with glasses by him a certificate signed by him wherein he shall set forth the amount charged, his post office address and the number of his certificate. Each person to whom a certificate has been issued by said bureau shall, before practicing under the same, register said certificate in the office of the prothonotary in each county wherein he proposes to practice optometry, and shall pay therefor such fee as may be lawfully chargeable for such registry. The prothonotary in each county shall keep a book for registering such certificates in the manner now provided by law for the registry of certificates of licensure of practitioners of medicine and surgery.

Sec. 7. Said bureau of optometrical education, examination and

licensure shall charge the following fees for all examinations that may be conducted by it: The sum of twenty-five dollars for a standard examination, ten dollars for a limited examination, one dollar per annum for a revision of the record of each certificate issued by it so long as the person to whom it was issued continues to practice optometry. It shall adopt a seal and certificate of suitable design, and shall have an office at Harrisburg, in this commonwealth, where examinations may be held and where all its permanent records shall be kept, which records shall be open to public inspection. It shall have power to make requisition upon the proper state officials for offices, rooms and supplies, including stationery and furniture. All printing and binding necessary for the work of said bureau shall be done by the state printer upon an order issued by said bureau through its president and secretary to the superintendent of public printing and binding.

Sec. 8. All fees received by said bureau for examinations or from any other source shall be utilized in regulating the practice of optometry and paying the expenses of the bureau as provided for in this act, any surplus to be turned over to the state treasurer at least once in each twelve months. An annual audit of the accounts of the bureau shall be made by the auditor general of the commonwealth. The treasurer of said bureau shall give a bond to the commonwealth of Pennsylvania in the sum of two thousand five hundred dollars for the faithful performance of his duties; said bond to be approved by the bureau of optometrical education, examination and licensure and by the attorney general of the commonwealth, who shall be custodian of the bond.

Sec. 9. The bureau of optometrical education, examination and licensure shall refuse to grant a certificate of licensure to any applicant and may cancel, revoke or suspend the operation of any certificate by it granted for any and all of the following reasons, to-wit: The conviction of a crime involving moral turpitude, habitual intemperance in the use of ardent spirits or stimulants, narcotics or any other substance which impairs the intellect and judgment to such an extent as to incapacitate for the performance of the duties of an optometrist, the certificate of licensure of any person convicted of a violation of Section 2 of this act shall be ipso facto revoked.

Any person who is the holder of a certificate of licensure or who is an applicant for examination for a certificate of licensure against whom is preferred any charges, shall be furnished by the bureau with a copy of the complaint and shall have a hearing before the bureau, at which hearing he may be represented by counsel. At such hearing witnesses may be examined for and against the accused respecting the said charges, which examination shall be conducted in the manner usually followed in the taking of testimony before commissions in this commonwealth. The suspension of a certificate of licensure by reason of the use of stimulants or narcotics may be removed when the holders thereof shall have been adjudged by the said bureau to be cured and capable of practicing optometry.

Sec. 10. An applicant for a certificate of licensure who has been examined by the state board of optometrical examiners of another state which through reciprocity similarly accredits the holder of a certificate issued by the bureau of optometrical education, examination and licen-

sure of this commonwealth to the full privilege of practice within such state, shall on the payment of a fee of twenty-five dollars to the said bureau and on filing in the office of the bureau a true and attested copy of the said license certified by the president or secretary of the state board issuing the same, and showing also that the standard of requirements adopted and enforced by said board is equal to that provided for by this act shall, without further examination, receive a certificate of licensure, provided that such applicant has not previously failed at an examination held by the bureau of optometrical education, examination and licensure of this commonwealth.

Sec. 11. Nothing in this act shall be construed as conferring on the holder of any certificate of licensure issued by said bureau the title of doctor, oculist, ophthalmologist or any other word or abbreviation indicating that he is engaged in the practice of medicine or surgery or in the treatment or the diagnosis of diseases of or injuries to the human eye or the right to use drugs or medicines in any form for the treatment or examination of the human eye.

Sec. 12. The provisions of this act shall not apply to physicians or surgeons practicing under authority of licenses issued under the laws of this commonwealth for the practice of medicine or surgery or persons who sell spectacles and eyeglasses who neither practice nor profess to practice optometry.

Sec. 13. This act shall take effect and be in full force from the date of the appointment of the said bureau by the governor as herein provided.

Sec. 14. Wherever in this act the singular number is used it shall be interpreted as meaning both singular and plural if compatible with the sense of the language used, and vice versa, and wherever in this act the masculine gender is used it shall be construed as comprehending also the feminine gender.

Sec. 13. All acts or parts of acts inconsistent with this act are hereby repealed, it being intended that this act shall furnish a complete and exclusive system of and in itself for obtaining the right to practice optometry in the Commonwealth of Pennsylvania and for the regulation of the practice of optometry therein.

TENNESSEE OPTOMETRY LAW.

1915.

An act to be entitled an act to define and regulate the practice of optometry in the State of Tennessee, and to provide penalties for the violation of this act, and to repeal Chapter 39 of the Acts of 1907, being an act to regulate the practice of optometry in the State of Tennessee and punish violators thereof, and to repeal Chapter 131 of the Acts of 1909, being an act entitled an act to amend an act entitled "An Act to regulate the practice of optometry in the State of Tennessee, and to punish violators thereof," said act being Chapter 39 of the Acts of the General Assembly of the State of Tennessee, passed February 6, 1907, and approved February 12, 1907."

Section 1. Be it enacted by the General Assembly of the State of Tennessee that the practice of optometry in the State of Tennessee is hereby defined to be "the employment of any method or means, other than the use of drugs, for the measurement of the powers of vision and

the adaptation of lenses for the aid thereof, embracing graduated test type on charts or cards, use of trial lenses, or other scientifically constructed instruments that reveal the static and refractive conditions of the eye, and make known the proper corrections.

Sec. 2. Be it further enacted that it shall be unlawful for any person to practice or attempt to practice optometry, or to profess by public advertisement in any manner to practice optometry in the State of Tennessee without first having complied with the provisions of this act as hereinafter provided.

Sec. 3. Be it further enacted that it shall be the duty of the governor to appoint before or on July 1, 1915, a board of examiners, which board is hereby created, whose duty it shall be to carry out the purpose and enforce the provisions of this act. This board shall be known and styled the Tennessee State Board of Optometry, and shall consist of five optometrists actively engaged in the practice of optometry. One member of said board shall be appointed from each of the three grand divisions of the state, and two members of the board from the state at large. Each member of the board shall hold office for five years and until his or her successor is appointed and shall have qualified, except that in the original appointment two members of said board shall be appointed for two years, two for three years, and one for five years from July 1, 1915, the terms of office of each to be designated by the governor at the time of appointment, and their commissions limited accordingly.

Thereafter appointments shall be made by the governor at the expiration of each member's term of office, or to fill vacancies created by death, resignation, removal from the state, or any other cause, from a list of names selected and recommended by the Tennessee (State) Optical Society and transmitted to the governor by the secretary of said society; but all appointments by the governor to fill vacancies caused by death, resignation or removal from the state or removal for any other cause, shall be made for the residue of the term of such member.

All persons so appointed shall have been residents of this state, actively engaged in the practice of optometry as defined in this bill, for at least five years preceding the time of such appointment. No member of said board shall be eligible to serve as member for more than two consecutive terms, and he shall be neither a stockholder, a member of the faculty, or a member of the board of trustees of any school of optometry, or instructor of optometry or financially interested in an exclusive manufacturing or wholesale optical house, or instruments used by optometrists. Members of said board, before entering upon their duties, shall respectively take and subscribe to the oath required for other state officers, and such oaths shall be filed with the secretary of the state.

The governor may remove at his discretion any member for the continued neglect of his duties required by this act.

Sec. 4. Be it further enacted, that said board shall meet at least once in each year, on the first Tuesday in September of each year, at place designated by said board, and in addition thereto, whenever and wherever the president and secretary thereof shall call a meeting, which

they are hereby empowered to do whenever in their judgment the same shall be necessary.

A majority of said board shall constitute a quorum for any meeting and the proceedings thereof shall be open for public inspection.

Said board shall elect at their first regular meeting, and annually thereafter, one of its members as president, and one of its members as secretary and treasurer of said board.

Sec. 5. Be it further enacted, that said board shall prescribe the duties of these officers and shall require the secretary and treasurer to give proper and sufficient bond for the faithful performance of his duties, and said secretary and treasurer shall receive such compensation for his duties as may be determined by the board, which compensation shall not exceed the sum of \$200.00 per annum.

Said board may make such rules and regulations not inconsistent with the laws of the state as may be necessary for the proper performance of its duties and shall have the power and authority to enforce the provisions of this act, and any member of the board may administer oaths and take testimony concerning any matter within the jurisdiction of said board.

Sec. 6. Be it further enacted, that any person having taken the oath above provided for and shall swear falsely to any matter before the said board or any officer thereof shall be guilty of perjury, and shall be punished in the same manner and subject to the same penalties as is now provided by the statute laws of the state for the offense of perjury.

Said board shall have and keep a common seal and shall keep a record of all proceedings of meetings, and a record in which shall be registered the names, post office address, number of certificate, date of issue and how obtained, of all persons authorized under this act to practice optometry in this state.

Sec. 7. Be it further enacted, that any and every person desiring to begin or to continue the practice of optometry in this state after the passage of this act shall, except as hereinafter provided, show to said board by satisfactory evidence verified by oath, that he is more than 21 years of age, of good moral character, has a preliminary education equivalent to at least one year in a public high school as graded and passed in this state, and has also studied not less than two years under a registered optometrist acceptable to the board; or has attended a course in optometry covering a period of not less than two years, or has graduated from a school of optometry maintaining a standard satisfactory to the said board and submitted to an examination to determine his qualifications therefor.

Said examination shall include theoretical, practical and physiological optics, and theoretical and practical optometry, and the anatomy and physiology of the eye.

If the person so presenting himself for examination is possessed of the necessary qualifications the board shall issue to said applicant a certificate of qualification signed by a majority of the members thereof, authorizing him to practice optometry in the state of Tennessee, but not as an itinerant optometrist.

Sec. 8. Be it further enacted, that said examining board shall have the right to register at its discretion, without examination, any person

that submits proof verified under oath as to his moral character, and who has been registered as an optometrist in another state by examination under its laws, which in the opinion of the board maintains a standard substantially similar to that provided for in this act.

Sec. 9. Be it further enacted, that any and all persons who hold a certificate either by exemption or by examination secured before the board of examiners in optometry appointed under the acts of 1907 and 1909, shall be entitled to receive a certificate from the examining board signed by a majority of the members thereof, authorizing him to practice optometry in this state without further examination upon presentation of application, proof verified under oath, and the surrender of the old certificate.

Sec. 10. Be it further enacted, that to provide for the proper and efficient enforcement of this act said board shall charge and collect the following fees, namely:

For issuing certificate of registration as provided for under Sec. 9, \$3.00; for issuing certificate of registration as provided for under Sec. 8, \$25.00; for the examination of an applicant, \$20.00; for the issuing and registration of a certificate as provided for under Sec. 7, \$5.00; for issuing an itinerant license as provided for in Sec. 12, \$25.00.

If an applicant should fail to pass a satisfactory examination he shall be entitled to another examination provided he applies and takes same in not less than six months nor more than twelve months thereafter, without the payment of any additional fee; but for all subsequent examinations which shall occur at intervals of not less than six months, he shall pay a fee of \$10.00.

Sec. 11. Be it further enacted, that said board shall be entitled to receive a fee of \$2.00 for reissuing a duplicate of a certificate of registration that has been lost or destroyed. All fees shall be paid in advance to the secretary and treasurer of said board except the fee of fifty cents, which shall be paid to the county court clerk of the county for recording the certificate.

Sec. 12. Be it further enacted, that it shall be unlawful for any person holding a certificate of registration to practice optometry in this state to become an itinerant practitioner without first having received a license from said board to engage in such practice in this state.

That the said board of examiners shall have the power to issue to persons holding certificates of registration a license to become an itinerant practitioner upon the payment of a fee of \$25.00 per year. No fraction of a year license shall be granted or issued.

The itinerant practitioner of optometry shall be defined as a person, either principal or agent, who engages in a temporary or transient practice in this state, either in one locality or in traveling about the country, or from place to place, or from house to house, soliciting in person or by advertisement, patrons for optometry service.

Sec. 13. Be it further enacted, that every registered optometrist who desires to continue the practice of optometry in this state after the year 1915 shall annually on or before the first day of April of each year pay to the secretary of said board of examiners a registration fee to be fixed by the board, and which shall in no case exceed the sum of \$3.00 per annum, for which he shall receive a renewal of such registration,

and in case of default of said payment by any person, his certificate shall be revoked by the board of examiners on twenty days' notice in writing by the secretary, which notice shall state the time and place at which such revocation shall be considered, and the deposit of such notice in the mails, addressed to the person at his last known place of residence or business, with the proper postage prepaid thereon, shall be due and legal service of such notice, but no certificate shall be revoked for such non-payment if the person so notified shall pay on or before the time of consideration of said revocation, his fee and such penalty as may be imposed by said board, provided said penalty shall not exceed \$10.00.

Any person whose certificate of registration has been revoked for failure to pay his renewal as herein provided, may apply at any time within twelve months to said board to have said certificate reissued, and the same shall be granted to him upon his paying to the board all removal fees which should have been paid had the certificate of registration not been revoked, together with a penalty of \$25.00. The said penalties are hereby declared to be a just and legal charge upon the property and estates of all persons falling within the purview of this act, and said board of examiners are hereby empowered to bring and maintain actions at law against any person in default.

Sec. 14. Be it further enacted that every person to whom a certificate of registration shall be issued shall immediately cause the same to be recorded in the clerk's office of the county of his residence, and also in the clerk's office of each other county wherein he shall then practice or thereafter commence the practice of optometry. Every person practicing optometry must also display his certificate of registration in a conspicuous place in the principal office wherein he practices optometry and whenever required, exhibit said certificate to said board or its authorized representative.

All persons holding certificates as provided for in this act when practicing said profession outside of or away from said office or place of business shall deliver to each customer or person so fitted with glasses, a bill of purchase which shall contain his signature, date of sale, home post office address, and the number of his certificate of registration, together with a specification of the lenses and frame or mounting furnished, and the price charged for same.

Sec. 15. Be it further enacted, that the several county court clerks in this state shall keep in a well bound book provided for that purpose, a complete list of certificates recorded by him, with the date of issue, date of record, number of certificate, name and residence of holder.

On the first day of January in each year hereafter said county court clerk shall make out and forward by mail to the secretary of said board of examiners a full and complete copy of said book for the preceding year, and at the same time reporting all deaths and removals which may have occurred in his county, together with certificate marked revoked.

Sec. 16. Be it further enacted that said board may employ an attorney or other necessary assistants to aid in the enforcement of the provisions of this act, and the expense of same shall be paid out of the

funds in the hands of said board, but it shall in no event be a charge against the state.

Sec. 17. Be it further enacted that the board shall have the power to revoke any certificate of registration or the right of any recorded person to practice or to suspend the same for extravagant claims, or misleading statements made in advertisements, fraud or deceit in practice, or in obtaining his or her certificate of registration, or for conviction of crime, or for habitual drunkenness, or for the excessive use of intoxicating liquors or narcotic drugs, which use shall have been continued for six months immediately preceding the filing of said charges, or for gross incompetency.

Before a certificate shall be revoked charges must be preferred in writing by any registered optometrist in the state or by any person or corporation in the state, or the board may of its own motion, direct the secretary of the board to prefer charges. Said charges shall be filed with the secretary of the board, and before any action is taken the accused party shall have written notice of the charge or charges made against him, which notice shall be mailed to his last known address, with the proper postage prepaid thereon, and a day specified therein, which day shall be at least ten days after the service thereof, at which time a public hearing will be given before said board, where the accused shall have the opportunity to produce testimony in his own behalf, and confront the witnesses against him. Three of the members of the board shall constitute a quorum for any such hearing.

Witnesses at such hearing shall testify under oath, which may be administered as hereinbefore provided. The board shall have the power to compel the attendance of witnesses and the production of documents at any such hearing.

If the board shall find, after investigation, that said charges, or any of them, are sustained the secretary shall be instructed to revoke and annul the certificate of such person and shall forthwith transmit to the clerk of the county or counties in which said accused person is registered as an optometrist, a notice under the seal of the board, certifying that such registration has been revoked, or annulled, as the case may be, and said clerk shall, upon receipt of said notice file the same and forthwith mark the said registration revoked or annulled.

When the certificate of any person to practice under this act has been revoked as herein provided, the board may, at the expiration of one year receive an application for renewal of the right to practice, and upon such new application they may, in their discretion, grant a new certificate. Any person who shall practice optometry after his or her registration has been revoked or annulled shall be deemed to have practiced as without registration and be subject to the penalties therefor as provided by this act.

All fees, assessments, or penalties herein provided shall be paid to the secretary and treasurer, and he shall hold the money coming into his hands and pay same out only on order of the board, signed by the president, for the legitimate expenses incurred by the board or its members in carrying out the provisions of this act. All surplus money received and on hand in excess of \$800.00 shall be paid to the state

treasurer at the end of each fiscal year of said board, which same shall go into and become a part of the common school fund of the state.

Sec. 18. Be it further enacted, that out of the fund coming into the possession of said board each member thereof shall be entitled to receive \$6.00 per day for each and every day actually spent in attendance on said board's business, together with his necessary traveling expenses, provided said member files with the secretary at the time an itemized statement of said expenses, and the same shall be paid from a fund accruing from the fees, assessments and penalties received by the board under the provisions of this act, but no part of the salary or other expenses of the board shall ever be paid out of the state treasury.

Sec. 19. Be it further enacted, that it shall be the duty of the president of the Tennessee (State) Optical Society at each annual meeting after the passage of this act, to appoint a committee of three of its members whose duty it shall be to audit the books and accounts of said board for the past year. Said auditing committee shall submit a report of its findings to the Tennessee (State) Optical Society and to the governor. The expense of said auditing committee shall be paid by the said board.

Sec. 20. Be it further enacted, that the board shall permit said auditing committee to inspect its books, records and minutes of proceedings, and shall furnish the committee with an itemized statement of all optometrists registered under this act and the names of all persons whose certificates of registration have been revoked or annulled during the past year.

Sec. 21. Be it further enacted that said board shall make a complete report of all receipts and disbursements, proceedings and official acts during the preceding year to the governor on August 1st of each year.

Sec. 22. Be it further enacted, that nothing in this act shall be so construed as to apply to physicians lawfully entitled to practice medicine in this state nor to merchants or others who neither practice nor profess to practice optometry who sell spectacles, eyeglasses or lenses, either on prescription from such physicians or from duly qualified optometrists, or as articles of merchandise from permanently located and established places of business, without attempting to test the eyes or attempting to fit said spectacles or eyeglasses or lenses to the eyes of the purchaser.

Sec. 23. Be it further enacted, that it shall be unlawful for any person, firm or corporation to sell or give away eyeglasses as a premium for merchandise or periodicals, or that any person holding himself out as an optometrist or practitioner of optometry, who practices or attempts to practice optometry or holds himself out as a qualified optometrist when not so qualified, or who impersonates a qualified and registered optometrist, or advertises or claims to be able to correct optical defects of the eye, whether for pay or otherwise, or who practices optometry as an itinerant, or attempts so to do without being licensed as herein provided, not being authorized to practice optometry in this state as herein provided, or any person who in any other manner violates any of the provisions of this act, shall be guilty of a misdemeanor and shall for each offense be punished by a fine of not less than \$50.00 nor more than \$200.00, or by imprisonment in the county jail

for not less than one month, nor more than three months, or both, in the discretion of the court. All fines thus received shall be paid to the common school fund of the county in which said conviction takes place.

Grand juries shall have inquisitorial powers in the investigation of any violations of the provisions of this act.

Sec. 24. Be it further enacted, that all acts or parts of acts in conflict with this act be, and the same are hereby repealed.

Sec. 25. Be it further enacted, that this act shall take effect on July 1, 1915, the public welfare requiring it.

Approved May 5, 1915.

NEW YORK OPTOMETRY LAW.

1915.

Sec. 300. *Definition; application of article.* The practice of optometry is defined to be the employment of any means, other than the use of drugs, for the measurement of the powers of vision and the adaptation of lenses for the aid thereof.

Sec. 301. *State Board of Examiners.* The board of examiners in optometry is continued. The members of said board now in office shall continue in office until the expiration of their respective terms. Such board of examiners shall consist of five persons, appointed by the state board of regents, and shall possess sufficient knowledge of theoretical and practical optics to practice optometry and shall have been residents of this state actually engaged in the practice of optometry for at least five years. The term of each member of said board shall be three years, or until his successor is appointed, and vacancies shall be filled for the unexpired term only.

Sec. 302. *Powers of Board.* Said board of examiners shall, subject to the approval of the regents, make such rules and regulations, not inconsistent with the law, as may be necessary for the proper performance of its duties; any member of the board may upon being duly designated by the board, or a majority thereof, administer oaths or take testimony concerning any matter within the jurisdiction of the board.

Sec. 303. *Examinations; Certificates of Practitioners.* Every person desiring to commence or to continue the practice of optometry after January 1, 1909, except as hereinafter provided, upon presentation of satisfactory evidence, verified by oath, that he is more than 21 years of age, of good moral character, has a preliminary education equivalent to at least two years in a registered high school, and has also studied at least three years in a registered optometrist's office, or has graduated from a school of optometry maintaining a standard satisfactory to said board of regents, shall take an examination before said board of examiners to determine his qualifications therefor. Every candidate successfully passing such examination shall be registered by said board of regents as possessing the qualifications required by this article, and shall receive from said board of regents a certificate thereof, but any person who shall submit to said board of examiners satisfactory proof as to his character, competency and qualifications, and that he has been continuously engaged in the practice of optometry in this state for more than two years next prior to the time that Chapter 460 of the laws of 1908 took effect, may upon the recommendation of said board of examiners, receive from the board of regents a certificate of exemption from

such examination, which certificate shall be registered and entitle him to practice optometry under this article. Every person who was, on the 21st day of May, 1908, when Section 209d of the Public Health Law, as then known, took effect, entitled to a certificate of exemption as therein provided, but who failed or neglected to make application therefor and present evidence to entitle him thereto, on or before January 1, 1909, as provided by said section, must make such application and present such evidence on or before July 1, 1909, or he shall be deemed to have waived his right to such certificate. Before any certificate is issued it shall be numbered and recorded in a book kept in the regents' office, and its number shall be noted upon the certificate. A photograph of the person registered shall be filed with the record and a duplicate thereof affixed to the certificate. In all legal proceedings the record and photograph so kept in the regents' office or certified copies thereof shall be prima facie evidence of the facts therein stated.

Sec. 304. *Certificate to be Recorded and Displayed.* Every person to whom a certificate of either registration or exemption shall be issued shall immediately cause the same to be recorded in the clerk's office in the county of his residence, and also in the clerk's office of each other county wherein he shall then practice or thereafter commence the practice of optometry; every person practicing optometry must also display his certificate of registration or exemption in a conspicuous place in the principal office wherein he practices optometry, and, whenever required, exhibit such certificate to said board of examiners or its authorized representatives. And whenever practicing said profession of optometry outside of, or away from, said office or place of business, he shall deliver to each customer or person so fitted with glasses, a bill of purchase, which shall contain his signature, home post office address and the number of his certificate of registration or exemption, together with a specification of the lenses furnished and the price charged therefor.

Sec. 305. *Fees.* The fee for such examination shall be \$15.00; for a certificate of registration, \$10.00, and for a certificate of exemption, \$5.00, to be paid to the board of regents and constitute a fund for expenses made necessary by this article. Such fees shall be paid into the state treasury and the legislature shall annually appropriate therefrom for the education department an amount sufficient to pay all proper expenses incurred pursuant to this article. The fee to be paid to the county clerk for recording a certificate shall be 50 cents.

Sec. 306. *Revocation of Certificate.* The board of regents shall have power to revoke any certificate of registration or exemption granted by it under this article the holder of which is guilty of any fraud or deceit in his practice, has been convicted of crime, or is an habitual drunkard, or grossly incompetent to practice optometry. Proceedings for revocation of a certificate or the annulment of registration shall be begun by filing a written charge or charges against the accused. These charges may be preferred by any person or corporation, or the regents may on their own motion direct the executive officer of the board of regents to prefer said charges. Said charges shall be filed with the executive officer of the board of regents, and a copy thereof filed with the secretary of the board of optometry examiners. The board of

optometry examiners, when charges are preferred, shall designate three of their number as a committee to hear and determine said charges. A time and place for the hearing of said charges shall be fixed by said committee as soon as convenient, and a copy of the charges, together with a notice of the time and place when they will be heard and determined, shall be served upon the accused or his counsel, at least 10 days before the date actually fixed for said hearing. Where personal service or service upon counsel cannot be effected, and such fact is certified on oath by any person duly authorized to make legal service, the regents shall cause to be published for at least seven times for at least 20 days prior to the hearing, in two daily papers in the county in which the optometrist was last known to practice, a notice to the effect that at a definite time and place a hearing will be had for the purpose of hearing charges against the optometrist upon an application to revoke his certificate. At said hearing the accused shall have the right to cross-examine the witnesses against him and to produce witnesses in his defense, and to appear personally or by counsel. The said committee shall make a written report of its findings and recommendations, to be signed by all its members, and the same shall be forthwith transmitted to the executive office of the board of regents. If the said committee shall unanimously find that said charges, or any of them, are sustained, and shall unanimously recommend that the certificate of the accused be revoked or his registration be annulled, the regents may thereupon, in their discretion, revoke said certificate or annul said registration, or do both. If the regents shall annul such registration, they shall forthwith transmit to the clerk of the county or counties in which said accused is registered as an optometrist, a certificate under their seal certifying that such registration has been annulled, and said clerk shall, upon receipt of said certificate, file the same and forthwith mark said registration "annulled." Any person who shall practice optometry after his resignation has been marked "annulled" shall be deemed to have practiced optometry without registration. Where the certificate of any person has been revoked, or his resignation has been annulled as herein provided, the regents may, after the expiration of one year, entertain an application for a new certificate, in like manner as original applications for certificates are entertained; and upon such new application they may in their discretion exempt the applicant from the necessity of undergoing any examination.

Sec. 307. *Violations of Articles.* No person not a holder of a certificate of registration or exemption duly issued to him and recorded as above provided shall after January 1st, 1909, practice optometry within this state. No person shall falsely personate a registered optometrist of a like or different name, nor buy, sell or fraudulently obtain a certificate of registration or exemption issued to another. Practicing or offering to practice optometry, or the public representation of being qualified to practice the same by any person not authorized to practice optometry, shall be sufficient evidence of a violation of this article. No person practicing or offering to practice optometry shall publicly represent himself to be a doctor, or shall assume the title of doctor or use such title or any abbreviation thereof in his practice, unless the right to use the same has been conferred upon him by some duly authorized

college or university, prior to the taking effect of this act. Any violations of the provisions of this article shall be a misdemeanor and courts of special sessions shall have jurisdiction of all such violations.

Sec. 308. *Construction of Article.* Nothing in this article shall be construed to apply to duly licensed physicians authorized to practice medicine under the laws of the State of New York, nor to persons who neither practice nor profess to practice optometry, who sell spectacles, eyeglasses or lenses either on prescription from such physicians or from such duly qualified optometrists, or as merchandise from permanently located and established places of business.

WISCONSIN OPTOMETRY LAW.
1915.

An Act to Create Section 1435f-35 of the Statutes, relating to the practice of optometry in this state.

The people of the State of Wisconsin, represented in Senate and Assembly, do enact as follows:

Section 1. There is added to the statutes a new section to read: Section 1435f-35. 1. The practice of optometry is defined as follows: The employment of any means other than the use of drugs, for the measurement of the powers of vision and the adaption of lenses for the aid thereof.

2. From and after the first day of July, 1916, it shall be unlawful for any person to practice optometry in this state, unless he shall first have obtained a certificate of examination and of registration as herein provided, and shall file the latter or a certified copy thereof with the county clerk of the county wherein he resides.

3. There is created a board whose duty it shall be to carry out the purposes and enforce the provisions of this section. This board shall be styled "The Wisconsin Board of Examiners in Optometry," and shall consist of five members to be appointed by the governor within sixty days from and after the passage of this act. All persons so appointed shall have been residents of this state, actively engaged in the practice of optometry as defined in this section, for at least five years immediately preceding the time of such appointment. Each member of said board shall hold office for five years, and until his successor shall be appointed, except that in the first appointment, one member shall be appointed for one year, one for two years, one for three years, one for four years and one for five years; the term of office of each to be designated by the governor at the time of appointment. Appointments to fill any vacancy caused by resignation, removal, or death of any member of the board, shall be made by the governor. Members of said board of examiners before entering upon their duties shall respectively take the oath required of other officers, said oath to be administered by the secretary of state and filed in his office. Said board shall have a common seal.

4. Said board shall choose at its first meeting and annually thereafter, one of its members as president and one as secretary, who shall severally during their term of office have power to administer oaths and take affidavits, certifying thereto under their hands and seal of the board. Said board shall meet at least once every six months at the state capital, and in addition thereto, whenever and wherever the presi-

dent and secretary thereof shall call a meeting. A majority of said board shall constitute a quorum. The secretary of said board shall keep a full record of the proceedings thereof, which shall be at all reasonable times open to public inspection.

5. Every person before beginning to practice optometry in this state, after the passage of this act, shall pass an examination before said board of examiners, except as hereinafter provided. Said examination shall be confined to such knowledge as is essential to the practice of optometry, and shall include normal and abnormal refractive, accommodative and muscular conditions and co-ordinations of the eye, and subjective and objective optometry, including the fitting of glasses, the principles of lens construction and frame adjusting, and such other subjects as may be deemed necessary.

6. Any person who has been admitted to practice optometry in any other state may be permitted to practice optometry in this state, in the discretion of the board, upon the payment of a registration fee of ten dollars and production of a certificate showing that he has passed an examination in such other state, and has actually practiced optometry therein for a term of two years.

7. Any person, having signified to the board of examiners his desire to be examined by it, shall appear before the board at such time and place as the board may designate. No person shall be eligible to take the examination before said board unless he is at least twenty-one years of age and shall have attended an optometry school for at least one year, a year's course to consist of not less than one thousand hours of actual instruction; or shall have served as assistant to a registered optometrist for at least two years and shall have registered with said board as an assistant optometrist at least two years before appearing for examination; provided, that all persons exempt shall have the privilege of taking such examination regardless of previous training. Said board is authorized and empowered to make such rules and regulations for conducting its examinations and for the standard of professional or special qualifications, as it may deem necessary. Before beginning such examination, each applicant shall pay to the secretary of the board the sum of ten dollars, and if he shall successfully pass the examination there shall be issued to him a certificate of examination and registration. All persons successfully passing such examinations shall be registered in a board register, which shall be kept by the secretary of said board.

8. Every person of at least twenty-one years of age and of good moral character who, at the time of the passage of this act, is engaged in the practice of optometry, as defined in sub-section 1 of this section, in this state, shall, within six months after the passage of this act, file an affidavit in proof thereof, together with the affidavits of two freeholders, with the secretary of said board, showing that he has been a resident of the State of Wisconsin for at least two years prior to the enactment of this act; and shall submit to an examination before such board, such examination to be in practical optics only. If such proof and examination are satisfactory to the board, he shall be granted a certificate of registration and examination.

9. Each recipient of said certificate of examination and registration

shall present the certificate of registration, or a certified copy thereof, for record to the county clerk of the county in which he resides, and shall pay a fee of fifty cents to the county clerk for recording the same. Said clerk shall record such certificates in a book to be provided by him for that purpose.

10. Any person so licensed, removing his residence from one county to another, or desiring to practice optometry in any other county than the one in which he resides, shall, before engaging in the practice of optometry in such other county, obtain from the county clerk in whose office said certificate was originally recorded, a copy of such record, certified, or obtain a new certificate of registration from the board of examiners, and shall, before beginning the practice of optometry in said other county, file same for record with the county clerk of the county to which he has removed or in which he desires to practice, and shall pay the clerk thereof for recording the same a fee of fifty cents.

11. Any failure, neglect or refusal on the part of any person holding such certificate, or copy of record, to file same for record as hereinbefore provided for six months after the issuance thereof shall forfeit the same. Said board shall be entitled to a fee of one dollar for the reissuance of any certificate, and the county clerk of any county shall be entitled to a fee of one dollar for making and certifying the record of any such certificate.

12. Every person, firm or corporation engaging in the practice of optometry shall cause to be displayed and kept in a conspicuous place, at the entrance of the place of business of such person, firm or corporation, the same of each and every person employed therein in the practice of optometry. Any person, firm or corporation violating the provisions of this sub-section shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished as hereinafter provided.

13. Each member of the board of examiners shall receive as compensation the sum of eight dollars for each day actually spent in performing the duties of said office, and in addition, his actual and necessary expenses. The secretary shall have such additional compensation as may be determined by the members of the board. The secretary shall give such bonds as the board may determine. Said board shall, on the first day of January of each year, make an annual report of its proceedings to the governor, which report shall contain an account of all of the moneys received and disbursed by them pursuant to this section. All moneys collected or received by each and every person for or on behalf of the Wisconsin board of examiners in optometry, in excess of one thousand dollars, shall be turned into the general fund of the treasury on the first day of January of each year. The president and secretary of said board shall, under oath, file annually with the governor a complete list of all registered optometrists possessing the proper qualifications to serve as members of the board of examiners as hereinbefore provided.

14. All registered optometrists shall pay annually to the board of examiners the sum of two dollars as a license fee for such year, the first payment to be made on or before the first day of January, 1916. In case of default of such payment by any person, his certificate may be revoked

by the board of examiners upon thirty days' notice of such proposed revocation to the holder of such certificate.

Sec. 15. Said board shall have power to revoke any certificate granted by them, if said certificate was obtained through error or fraud, or if the recipient thereof shall be shown to be grossly incompetent in the practice of optometry, or if it be shown that the holder thereof has obtained, or sought to obtain, money or any other thing of value by false or fraudulent representation in the practice of optometry. But before any certificate shall be revoked, the holder thereof shall enumerate the charges against him, and shall specify a date not less than thirty days after the service of such notice for a hearing by said board, and such person shall have opportunity to confront witnesses appearing against him, and to produce testimony in his own behalf. A stenographic report of such proceedings to revoke a license shall be made by the board and the transcript thereof kept in its files. The person whose license has been revoked may, within thirty days after the decision of the board, file with the secretary a written notice of appeal to the circuit court of the county wherein such person resides. Upon the filing of such notice, the secretary shall transmit to the attorney general a certified copy of the record and transcript of testimony of such proceedings, and the attorney general shall defend said board in the circuit court. Said circuit court shall affirm or overrule the action of the board, and such decision shall be final.

16. Any person whose certificate has been revoked for gross incompetence may, upon satisfactory proof to the board that such condition has been remedied, have the same regranted him.

17. Every person who, after the passage of this act, shall begin the practice of optometry in this state, or who shall continue in the practice of optometry after the first day of January, 1916, without having obtained a certificate of examination and of registration, or who, not having obtained such certificate, shall hold himself out to the public as qualified to engage in the practice of optometry as defined in this section, or any person who shall violate any of the provisions in this section shall be deemed guilty of a misdemeanor and, upon conviction thereof, shall be punished by imprisonment in the county jail for not less than one month nor more than three months, or by a fine of not less than twenty dollars nor more than one hundred dollars, or by both such fine and imprisonment.

18. It shall be the duty of the respective district attorneys to prosecute all violations of this section and jurisdiction of any violation thereof is extended to such courts as have jurisdiction over misdemeanors committed in the jurisdiction of the respective counties.

19. Nothing in this section shall be construed to apply to physicians and surgeons authorized to practice under the laws of this state, nor to persons who shall sell spectacles without attempting to test the eyes.

Sec. 2. This act shall take effect upon passage and publication.

The vote in the Senate and Assembly was:

Senate—Ayes, 21; noes, 11.

Assembly—Ayes, 63; noes, 11.

VIRGINIA OPTOMETRY LAW.

Approved March 11, 1916.

1. Be it enacted by the general assembly of Virginia, That the practice of optometry is hereby defined to be the employment of any means other than the use of drugs, for the determination of natural and functional deficiencies of the eyes and the adaptation of lenses for the aid thereof, and it shall be unlawful for any person to practice optometry in this state after the passage of this act, except as hereinafter provided.

2. That a board be, and the same is hereby established, composed of five members, whose duty it shall be to carry out the purposes and enforce the provisions of this act, and which shall be styled the "Virginia State Board of Examiners in Optometry." The governor shall, within sixty days from and after this act goes into effect, appoint five persons as such board, and who shall possess sufficient knowledge of theoretical and practical optics to practice optometry, and who shall have been residents of this state actually engaged in the practice of optometry within the meaning of this act for at least two years. For the purpose of such appointment, the Virginia State Optical Association, Incorporated, shall furnish the governor with the names of twice the number of examiners to be appointed, and thereafter similarly for each vacancy or new appointment and the governor may select said board from the names so furnished.

3. That the term of each member of said board shall be three years, or until his successor is appointed, and vacancies shall be filled for the unexpired term only, but in the original appointment of the members of the board two shall be appointed for a term of one year, two for two years, and one for three years.

4. That the said board shall make such rules and regulations not inconsistent with the law, as may be necessary for the proper performance of its duties; any member of the board may upon being duly designated by the board, or a majority thereof, administer oaths or take testimony concerning any matter within the jurisdiction of the board; the board shall adopt a seal and the secretary shall have the custody thereof, and shall keep a record of all proceedings of the board, which shall be open to the public at all proper times for inspection. Said board shall make annual report of its proceedings to the governor, including the names of all persons who have been registered and have license in force, and an account of all moneys received and disbursed by them, pursuant to this act, during the preceding year.

5. That provision shall be made by said board for holding examination of applicants for registration to practice optometry, at least twice in each year, if there be any such applicants.

6. That every person desiring to commence or to continue the practice of optometry after January the first, 1917, except as hereinafter provided, upon presentation of satisfactory evidence, verified by oath, that he is of more than twenty-one years of age, of good moral character, has a preliminary education equivalent to at least two years in a public high school, and has also studied at least three years in a registered optometrist's office, or has graduated from a school of optometry, maintaining a standard satisfactory to the board of examiners in optometry, shall stand an examination before said board of examiners

in optometry, which examination shall include anatomy, physiology, pathology of the eye, and the use of the ophthalmoscope, to determine his qualifications therefor. Every candidate successfully passing examination shall be registered by said board of examiners in optometry as possessing the qualifications required by this act, and shall receive from said board of examiners in optometry a certificate to that effect; provided, however, that any person who shall submit to the said board of examiners in optometry satisfactory proof that he is of good moral character, that he is and has been engaged in the practice of optometry in a permanent location of business in this state for more than one year next prior to the passage of this act, shall receive from the said board of examiners in optometry a certificate of exemption from such examination, which certificate shall be numbered and registered with said board and entitle him to practice optometry under this act.

7. That the fee shall be: For examination and certificate, ten dollars, to be paid to the secretary of the board by the applicant upon filing his application. If the applicant fails in no more than one subject, he may have one more examination at the next meeting of the board without any additional fee.

8. That every registered optometrist, whether by examination or exemption, shall pay to the secretary of the board each year on or before the first day of September, beginning 1917, three dollars as a yearly fee for renewal of certificate. The moneys so collected from fees shall constitute a fund for the expense made necessary by this act.

9. That the funds realized from the aforesaid fees and licenses shall be applied to the payment of all necessary expenses of the board of examiners in optometry, including a per diem of not more than five dollars to each member and necessary expense in traveling to and from place of meeting, when said board is in session, and the employment of attorney to assist in prosecuting violators of this act.

10. That every person entitled to a certificate of exemption as hereinbefore provided, must make application therefor, and present the evidence to entitle him thereto, on or before the first day of January, 1917, or he shall be deemed to have waived his right to such certificate. Before any certificate is issued it shall be numbered and recorded in a book kept by the said board of examiners in optometry, and its number shall be noted upon the certificate.

11. That all recipients of said certificates of registration shall present same for record to the clerk of the circuit court of the county, or to the corporation court of the city in which they reside, and shall pay a fee of fifty cents for recording same. Said clerk shall record said certificate in a book to be provided by him for that purpose. Any person so licensed, before engaging in the practice of optometry in any other county or city, shall before commencing the practice in said county or city, file the same for record with the clerk of the circuit court of the county, or corporation court of the city in which he desires to practice, and pay the clerk thereof for recording same a fee of fifty cents. Any failure, neglect or refusal on the part of any such person holding such certificate to file same for record as hereinbefore provided, for thirty days after the issuance thereof, shall forfeit the same, and said certificate shall become null and void.

12. That any person practicing optometry shall display his certificate of registration or exemption in a conspicuous place in the principal office wherein he practices. Whenever practicing outside of or away from his office, he shall deliver to each person whom he fits with glasses a bill of purchase, which shall contain the signature, home address, and number of his certificate of registration or exemption, together with a specification of the lenses and the price charged therefor.

13. That the said board shall revoke a certificate of registration or exemption if the holder thereof is in default in the payment of his yearly license for more than thirty days after being notified of such default; is guilty of fraud or deceit in his practice; has been convicted of crime; is an habitual drunkard, or is incompetent to practice optometry; provided, that no certificate shall be revoked until the holder is given a hearing before the said board after ten days' written notice of the time and place of such hearing served by the secretary of the board by registered mail at the last known address of such person. A person who shall practice optometry after the revocation of his certificate shall be deemed to have practiced without a certificate. A person whose certificate has been revoked may, after the expiration of one year from the date of such revocation, apply for a new certificate, in the manner provided for original applications, and the board may in its discretion exempt the applicant from examination and grant him a certificate.

14. That no person not a holder of a certificate duly issued to him and filed as provided shall, after January first, nineteen hundred and seventeen, practice optometry in this state. No person shall falsely personate a registered optometrist of a like or different name, nor buy, or sell, or fraudulently obtain a certificate issued to another.

Practicing or offering to practice optometry, or the public representation of being qualified to practice the same by any person not authorized to practice optometry, shall be sufficient evidence of a violation of this act; provided, however, employers of practitioners of optometry in connection with their optical business, may, in case of a vacancy in such position, fill the same by the employment of some person deemed competent. And the said person shall at once announce to the board his readiness for examination, and may continue in his work until examined by the board, and his fitness so determined.

15. That any violation of the provisions of this act shall be a misdemeanor, and shall be punished by a fine of not less than twenty-five dollars, or more than one hundred dollars, or by imprisonment of not less than thirty days, or more than six months, or by both fine and imprisonment. It shall be the duty of the respective commonwealth's attorney to prosecute all violations of this act.

16. That nothing in this act shall be construed to apply to duly licensed physicians, authorized to practice medicine under the laws of the state of Virginia, nor to persons who sell spectacles, eyeglasses, or lenses, either on prescriptions from physicians or duly qualified optometrists, or as merchandise from a permanently located and established place of business.

GEORGIA OPTOMETRY LAW.

1916.

Optometry Defined.

Section 1. Be it enacted by the general assembly of the state of Georgia, and it is hereby enacted by the authority of the same, that from and after the passage of this act, optometry or the practice thereof is defined to be the employment of any means, other than the use of drugs, for the measurement of the powers of vision and the adaptation of lenses for the aid of same.

Board of Examiners in Optometry—How Appointed.

Sec. 2. Be it further enacted, that within thirty days after the passage of this act, it shall be the duty of the governor to appoint for this state a board of examiners in optometry to consist of five members. The said board shall be styled the Georgia State Board of Examiners in Optometry, and its members shall be persons who have been actively engaged in the practice of optometry in the state of Georgia for five years immediately preceding such appointment; provided that no person is eligible to appointment on this board who is connected in any way with a school teaching optometry, or who sells optical goods at wholesale. Be it further provided that after the appointment of the first board only optometrists registered under the provisions of this act shall be eligible for appointment.

Oath of Examiners.

The said board shall file with the governor annually a complete list of the registered optometrists in this state. Within thirty days after the governor shall have notified the several members of their appointment, each member shall subscribe and forward to the governor the following oath: "I do swear that I will faithfully and impartially perform the duties of a member of the board of examiners in optometry for the state of Georgia to the best of my ability, so help me God." Upon such oath being filed in the office of the governor of this state, he shall issue to said examiner a certificate of appointment.

Terms of Office of Examiners.

Sec. 3. Be it further enacted, that the term of office of each member of said board of examiners in optometry shall be three years, provided that two members shall be appointed for one year, two for two years, and one for three years, and after the expiration of the terms of office of the members so first appointed, subsequent appointments shall be for a term of three years, and any vacancy that may occur from any cause shall be filled by the governor for the unexpired term.

Organization of Board and Meetings.

Sec. 4. Be it further enacted, that said board at the first meeting after the appointment of its members and annually thereafter, shall elect a president, vice-president and secretary-treasurer, who shall hold their offices until their successors are elected and qualified. The secretary-treasurer shall give a bond with security in such sum as said board may determine. Said board shall prescribe such rules, regulations and by-laws for its proceedings and government as will carry into effect the provisions of this act.

Register to be Kept by Board.

There shall be at least two regular meetings of the board of ex-

aminers held every year on the first Wednesday in January and July. Special meetings may be held on the call of the president and two other members. A majority of said board shall constitute a quorum. The board shall keep a record of its proceedings and a register of all applicants for license, giving the name, age and residence of applicant and the county in which he proposes to practice; and also show the date of examination, whether the applicant was rejected or granted a license, and the manner of the license granted.

Fees and Expenses of Board.

Sec. 5. Be it further enacted, that all fees provided for in this act shall be paid in advance to the treasurer of the board, to be held as a fund for the use of said board. No funds shall be paid out except on a warrant signed by the president and secretary of the board and no expense shall be created in excess of the fees as herein provided. Such funds shall be applied by the board to the payment of its expenses and to making a reasonable compensation to the members thereof.

License to Practice—How Obtained.

Sec. 6. Be it further enacted, that from and after the passage of this act, all persons engaged in the practice of optometry or who wish to begin practice of same in this state shall make application to the board to be registered and for a certificate of registration. Such registration and certificates shall be granted to such applicants, but only upon compliance of the following conditions contained in subdivisions 1, 2 and 3 of this section.

Persons Exempt From Regular Examination.

(1) The applicant shall be registered and given a certificate of registration on passing a satisfactory examination limited to a demonstration of practical work, if he shall present satisfactory proof on or before March 1, 1917, of being twenty-one years of age, of good moral character and of having been continuously engaged in the practice of optometry in this state for at least two years prior to the passage of this act. The fee for registering such applicants shall be ten dollars.

(2) The applicant shall be registered and given a certificate of registration if he holds a valid license from such other state boards or optometry as may be, under the rules of comity, recognized by the Georgia State Board of Examiners in Optometry. The fee for registering such applicant shall be ten dollars.

Examination of Applicant for License to Practice.

(3) From and after March 1, 1917, any applicant for registration under this act shall be required to pass an examination as hereinafter provided. Such applicant shall be twenty-one years of age, of good moral character, and shall be possessed of an education equal to a two year's high school course. He shall have been employed as an assistant in the office of an optometrist, registered under this act, for a period of not less than two years, or shall hold a diploma from a school of optometry approved by this board, provided that after July 1, 1917, all applicants for examination shall hold a diploma from a school of optometry requiring a two years' attendance course and satisfactory to this board. The said board shall examine all applicants shown to have

the necessary qualifications, as above set forth, in the following subjects: Ocular anatomy and physiology; theoretic optics; theoretic and practical optometry, including normal and abnormal refractive, accommodative and muscular conditions of the eye as applied by recognized methods of subjective and objective optometry when determining the need of glasses.

License Must be Recorded in County in Which Practice is Conducted.

When the applicant shall attain an average standing of 75 per cent. on all subjects submitted he shall be deemed to have passed satisfactorily and be given a certificate of registration, which certificate, and any other certificate provided for in this section shall operate as a license to practice optometry in this state when it shall have been recorded in the office of the clerk of the superior court of each county in which said person practices. The clerk of said court shall be entitled to a fee of one dollar for recording such certificate. The fees for applicants of this class shall be fifteen dollars for examination and ten dollars for registration. Failure to pass a satisfactory examination shall not debar the applicant from participating in subsequent examinations before said board, upon his complying with the provisions of this act.

Right of Appeal.

Sec. 7. The state board of examiners in optometry shall refuse to issue the certificate of registration provided for in this act to any person who shall have been guilty of grossly unprofessional and dishonest conduct, and said board after due notice and hearing may revoke the certificate issued to any optometrist whose certificate of registration was obtained or issued through error, fraud or perjury, or who shall be guilty of an offense involving moral turpitude; provided an appeal may be taken from the action of the board to the superior court of the county in which the certificate was refused or revoked by the board, upon applicant giving a good and satisfactory bond to be approved by the court, to secure the costs of such an appeal should the appeal be determined against him.

Practicing Without a License and Fraudulently Practicing Prohibited.

Sec. 8. Be it further enacted, that after March 1, 1917, it shall be unlawful for any person to practice optometry in the state of Georgia unless he shall have first obtained a license from the state board of examiners as herein provided and filed same with the clerk of the superior court of the county in which such practice is conducted, and that any person who shall practice or pretend to practice optometry as defined in this act, without having first obtained license as herein provided, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished as for a misdemeanor.

Dealers Who Sell Glasses as Merchandise Require no License.

Sec. 9. Be it further enacted, that nothing in this act shall be construed to apply to physicians and surgeons duly licensed to practice medicine under the laws of this state, nor to prevent persons from selling spectacles or eyeglasses on prescription from any duly qualified optometrist or physician, nor to prevent any person or persons selling glasses as an article of merchandise, or from using test cards in connection with the sale of such glasses at a permanently located place in

this state when not trafficking or attempting to traffic upon assumed skill in optometry. Neither shall anything in this act be construed to authorize any registered optometrist to prescribe or administer drugs or practice medicine or surgery in any manner as defined by the laws of Georgia; nor shall the same be construed to authorize any such person to use the title of M. D. or any other title mentioned in section 15 of the act regulating the practice of medicine, approved on the 18th day of August, 1913.

Sec. 10. Be it further enacted, that all laws and parts of laws in conflict with this act be, and the same are, hereby repealed.

Approved by governor August 7th, 1916.

RESUMÉ.

As has been seen, there is a great similarity between the laws of the different states—still the laws are not the same, and in a series of communications like the present, where the intention is to produce the actual legislative Acts as a work of reference, it is necessary to print them word for word, so that there may be no mistake in the intention and meaning of the published law. In a general way, however, it may be said that the intention of the legislative Acts has been similar, in the various states, and evidently means to convey about the following provisions.

It shall be unlawful to practice optometry without a properly obtained certificate or license. A person is assumed to be practicing optometry who has in his possession at his place of business, any of the mechanical means for fitting glasses, or who has a sign, notice or an advertisement implying that he claims to refract or fit eyes with glasses. In other words, a person may sell glasses as merchandise, but cannot fit them to the eyes, except to adjust the frames. In Maine the law distinctly states, however, that the practice of optometry is not meant to apply to itinerant peddlers or sellers of glasses. In Colorado, the usual license to practice optometry does not allow itinerancy. An itinerant license, however, can be obtained, by paying an additional fee. This allows traveling from house to house, soliciting trade individually or by advertising, etc. This lax clause in the law, would seem to almost nullify any good results that might possibly ensue from the passage of the Act. The same condition exists in Tennessee, only the special license costs twenty-five dollars. In Tennessee it is also unlawful for firms or individuals to give away glasses as premiums.

The practice of optometry consists in fitting glasses to eyes, by purely mechanical means, unassisted by drugs, medicines or surgery. The optometrist must not give out the impression of being in any sense a practitioner of medicine. He must not call himself a doctor of medicine, or even a doctor of optometry, or a doctor

of any kind, or an eye specialist, or anything of this nature whatsoever, calculated to deceive or mislead the public. He must adhere strictly to his own business, and not attempt in any way to encroach upon the territory of a doctor or of an ophthalmological specialist, except in so far as the fitting of glasses by purely mechanical means is concerned.

In Maryland, optometrists are not allowed to sell concave glasses to children under 15 years of age. Neither can they sell glasses to people who have diseased eyes, except it be with the knowledge and consent of a doctor. This restriction places a peculiar restriction on licensed optometrists, for it must always open up the question, as to the existence or non-existence of ocular disease, a question which must always be a stumbling block in the way of Maryland optometrists.

In order to regulate the practice of optometry, to see that only those properly qualified are allowed to practice, and to prosecute and punish those who transgress the law, boards of optometry have been organized in the various states. These boards are usually appointed by the governors, and they consist of from three to seven members as the states have decided. Sometimes the governors pick the men themselves, at other times a number of names are suggested to the governors by (probably) the state society of optometrists, and from these names, the requisite numbers are selected.

In South Dakota the registered optometrists constitute a legal society. They meet once a year, transact business, and recommend board members to the governor, who selects the members from this submitted list. The secretary of the board is also the secretary of the society, and receives a salary fixed by the society, and his expenses. In Pennsylvania the board consists of seven members, of which one shall be the superintendent of public instruction. The remaining six, are appointed by the governor. The superintendent, receives a salary of \$250.00 a year. In Illinois, the secretary of the board receives a salary of \$1500.00 a year, from the state treasury and is not a member of the board. In some states the board members are all experienced optometrists who have resided in a state a certain number of years, and in other states doctors of medicine, and ophthalmologists of repute, experience and requisite length of residence, are also placed upon the board. The members are appointed for from three to five years, and their appointments are so arranged that they do not all terminate at the same time. The first appointees are given certificates allowing them to practice their profession, without examination, but

as a rule, subsequent appointees must have submitted to examination, and obtained certificates before they are eligible to membership on the board. The members as a rule are required to swear that they will faithfully perform their duties, and they are allowed to administer oaths, take testimony, examine witnesses, etc., in matters concerning optometry in their several states. They must adopt a seal, and elect officers, which usually consist of a president and a secretary-treasurer, although some states elect a vice-president and a separate treasurer. The boards usually meet twice a year, in regular session, at specified places, but other meetings may occur if the board desires. At these meetings applicants are examined, reports read, complaints heard and acted upon, and other business transacted. The members are almost always paid for their services out of collected fees. They are usually paid about five dollars a day, and their expenses, or from three to five cents mileage. The secretary-treasurer usually has to file a bond, and some of the states pay him a small salary, as he has a good deal of work to do. Fees and fines are paid to him, and the state treasurer usually ultimately receives the money. These fees are used to pay board expenses, such as salaries, lawyers, stationery, stamps, etc. The money is all used as an optometrical fund in some states, and in others, any excess above a certain variable amount is given to some fund such as the public school fund, the general fund, etc. In most states, the expended money must never exceed the board receipts. In Florida, if the receipts for fees and fines are not sufficient to pay the board expenses the registered optometrists of the state may be assessed to the extent of \$15.00 each, if necessary. If they fail to pay this assessment, their license is revoked. The optometrist may, however, be reinstated by paying the assessment, and renewal fees, and a fine of twenty-five dollars. The board usually reports once a year to the governor. As a rule, no one connected with an optometrical school, or a wholesale optical establishment is eligible for membership on the board. One of the most important functions of the board is the issuing of licenses to practice. These licenses are usually two in character. First, those granted to applicants who have already been in practice a certain number of years, and second, those granted to applicants who desire to begin the practice of optometry. Those in practice a certain number of years before the passage of the optometry law have privileges accorded them not accorded those who seek to enter the profession. In most of the states a man who has been in practice a certain specified number of years, must make

application to the board for a license to practice within a limited length of time, or his privileges will be surrendered, and he can only secure a certificate through the usual means of examination. He does not have to be examined, if he applies for a license, within the time specified in the law. In some states, however, even if the time lapses, he can secure an extension by making application and paying a fine. If he fulfills the legal requirements he can obtain a license by the payment of a fee, which is usually either \$5.00 or \$10.00. Some states require the applicant (already in practice) to be of good moral and business character and professional reputation, and to be vouched for by reputable fellow citizens. Certificates thus obtained are usually called "Certificates of exemption." In Massachusetts, those in practice for two years when the law was passed, who are of good character and reputation, may continue practicing for two years longer, but must then pass the regular examination in order to continue in practice. In Colorado, they must pass what is called a "practical examination," whatever that may mean. In Nevada, the old practitioners must also be examined, in the same way as the new applicants. In Pennsylvania, those in practice must take what is called a "simple examination," before a certificate can be obtained. If they fail, they can take a second and third examination, without extra fee, till January 1, 1917, at which time they will be compelled to undergo a regular examination. In Arkansas, any proper person practicing optometry one year before the passage of the law, may continue practicing for two more years, but must then go up for examination before the board—and pay \$10.00 for a certificate. In Georgia, those in practice must submit to a "practical examination." In Wisconsin, they must also pass a "practical examination." In some states, the question of what is to be done with those optometrists already practicing before the passage of the law, is not mentioned, and the board of examiners may evidently make whatever disposition of the matter seems to them to be best.

Concerning those applicants who have not actually practiced optometry, but who desire to do so, the laws of the different states are similar if not alike. In most of the states the applicant must be 21 years of age and of good moral character. He must have a good preliminary education, equal to about two years in high school. He must have studied optometry in a high grade acceptable school of optometry, requiring one or two years study, or else have worked as an assistant in a licensed optometrist's office, for two or three years, or both. In Wisconsin, no preliminary

education is necessary, and of course, the requirements in all the states is not as high as just given. In California, optical instruction is given in the free public schools. The course is for one year. They are the only optical schools recognized in the state. A certificate from such a school requires the board to issue a license. The board may, however, also examine applicants, and grant certificates on the merits of the examination. In most of the states the applicant must pay a certain amount (say \$10.00) down, before the examination by the board, and then another amount (say \$5.00) for the issuance of the certificate permitting the successful applicant to practice optometry. In case the applicant fails to pass the examination, he can usually have one, two or three subsequent examinations at future board meetings without extra charge. Of course, the cash amounts for examinations and certificates, varies in the different states. In some states, the initial sum paid down, is returned if the applicant fails to pass. In some states the board can refuse to grant a certificate, even if the examination is successfully passed, if in the opinion of the board the applicant is an undesirable individual and especially if it is shown that the certificate was fraudulently obtained, or if the applicant uses liquor or narcotics excessively or is guilty of any kind of unprofessional conduct. In some states the examinations are left to the discretion of the board, and in others, the directions are rather specific in their nature, and the percentages necessary to pass is distinctly stated. In some states the applicant must present a photograph of himself which may be kept by the board, and may be attached to his certificate. In most states the certificate must be filed with the county clerk (upon the payment of a small fee) where the optometrist proposes to practice within a certain length of time, or the certificate will be forfeited. It may be re-issued for a small fee. In case the optometrist wishes to practice in other counties in his state, he is usually required to file his certificate in each county, and pay the requisite filing fee. The optometrist must pay an annual state license fee of about \$2.00 for the privilege of practicing. In case these fees are not all paid, the license will be revoked. A new license will only be re-issued, upon payment of all back fees, and usually a fine. In case he loses his certificate, the board is entitled to an extra fee for a re-issuance.

Licenses may be revoked at any time for a disobedience of any phase of the optometry law. They may also be revoked for fraud in obtaining a certificate, for dishonesty or misrepresentations in practice, for crime, gross incompetency, recent habitual drunken-

ness, or the excessive use of narcotic drugs, or for any kind of unprofessional conduct. They may also be revoked for not displaying the certificate in the practitioners office, or place of business or for being afflicted with any contagious or infectious disease. Before the license is revoked, however, the optometrist must be given due notice of the projected action, and be given every opportunity to defend himself. In case the license is revoked, the board can usually re-issue it after a certain period of time provided they believe that the objections to the ejected optometrist have been removed. A charge is made for such a re-issuance. In most states optometrists are allowed to practice in various counties in their state, by filing their certificate and paying for the service. They must, however, give each customer a bill of sale for any goods purchased, stating the formula for the glasses, and the amount paid. Upon this bill must also appear the full name of the optometrist, his home postoffice address, and the number of his certificate.

Emphasis should be laid upon the fact that licenses may be revoked for misrepresentations or unprofessional conduct. These are rather indefinite statements, but among other things they mean that an optometrist must not represent himself to be a "doctor" of any kind, or that he in any way treats or cares for diseased conditions. He must not use drugs or surgery. He must not seek to represent himself as being anything but a scientific fitter of lenses to the human eye. In some states he is forbidden to advertise or employ agents of any kind to work up business, and must content himself with being a simple "optometrist," and to call himself nothing but an "optometrist," either on his sign, or in any other manner. The fines for the non-observance of the optometry law, varies in the different states, but offenders are usually fined for from about \$20.00 to \$200.00. In some states, if the offender does not pay the fine, he is compelled to go to jail and stay there until his fine is expiated. He stays in jail one day for every two dollars of his fine. There is usually a jail sentence also, running for from perhaps one month to three months. As a rule either punishment or both may be enforced. In some states, subsequent offenses are more severely punished, and in some licenses are temporarily or permanently revoked, if fines are enforced. The fines usually go to the benefit of some fund; generally to either the school fund or the optometrist fund. In almost all the states the optometry law does not apply to legal practitioners of medicine and surgery, nor to merchants who merely *sell*, but do not attempt to *fit* glasses. In Arkansas, the law is not applicable to veterans of the Civil War.

Just what superhuman skill veterans of the Civil War are supposed to possess in the state of Arkansas, is not quite clear; neither can it be distinctly understood why these venerable veterans should be allowed to be at large, armed with the privilege of ruining human eye sight. Why not include arson or murder amongst those normally illegal acts usually punishable by the state, which Arkansas regards as permissible, if, peradventure, a man has served in the Civil War? It may naturally be concluded that southern chivalry rather got the best of the Arkansas legislators, when they finished up the optometry law. In some states the law endeavors to produce reciprocity between the various states, which is of course, a most commendable effort, if the optometry laws are commendable at all. In such states an optometrist from another state, is usually allowed to practice, provided the optometrical requirements are the same, or essentially similar, and provided the other state also allows reciprocity. The applicant must possess a good moral and business reputation, and pay a specified fee.

A word of explanation should be given concerning the state of Ohio. It might almost be said that they have, and also that they have not an optometry law in Ohio. The fact is the matter is yet to be settled by the courts. A clipping is here appended, from the February, 1916, issued of the "Ohio State Medical Journal," which explains how it happens that it is uncertain whether Ohio has an optometry law or not.

"The status of optometrists in Ohio is still undetermined. The Common Pleas Court of Franklin County announced late in January that the pending case would be heard in chambers. It is possible that this decision will determine the future of the state's policy in regulating these practitioners.

"The case pending in the courts is a consideration of an injunction secured by the state association of optometrists to restrain the State Medical Board from applying the provisions of the Platt-Ellis law to optometrists. If the court holds that optometry may be licensed in one of the groups of 'limited practitioners' under the law, the State Medical Board will immediately proceed to license the large number which have applied to date. If the court holds that optometry is not included in the provisions of the Platt-Ellis law, it will mean a transfer of the fight to the legislature. Optometrists have already announced that if they are successful in their legal battle, they will have a bill introduced again providing for a separate board to license and regulate their practitioners.

"At the present time, the case is largely dependent upon the

Medical Board, the attorney general is acting as counsel in resist-attorney general's office. As the legal representative of the State ing the attempt of the optometrists to escape registration by the medical board. Mr. Turner has given the matter careful consideration, and has assigned the defense to Judge Dickey, of Gal- lipolis, one of his able assistants. Realizing that an important prin- ciple affecting the public health is at stake, Judge Dickey has given the matter very careful consideration and it is firmly believed that the court will rule in favor of the medical board."

Meanwhile the trustees of the Ohio State University have estab- lished a school of optometry maintaining a two years' course in optometry.

Summarizing the legal status of the different states it is found that the following states have optometry laws:

Arizona	Nevada
Arkansas	New Hampshire
California	New Jersey
Colorado	New Mexico
Connecticut	North Carolina
Delaware	New York
Florida	North Dakota
Georgia	Oklahoma
Idaho	Oregon
Illinois	Pennsylvania
Indiana	Rhode Island
Iowa	South Dakota
Kansas	Tennessee
Maine	Utah
Maryland	Vermont
Massachusetts	Virginia
Michigan	Washington
Minnesota	West Virginia
Montana	Wisconsin
Nebraska	

The following states have no optometry laws:

Alabama	Missouri
District of Columbia	Ohio
Kentucky	South Carolina
Louisiana	Texas
Mississippi	Wyoming

A careful review of the laws on optometry in the different states, leads one to the conclusion that they have on the whole been care-

fully and conscientiously worded, and display an intention of forcing optometrists to adhere strictly to their own business, and not endeavor in any way to trespass upon the profession of medical and surgical ophthalmology, except, so far as refraction work, should be regarded as such an invasion. Of course, we ophthalmologists feel that refraction work is practicing medicine, and that it should be so regarded by the law makers of our various states. But the fact remains that 39 states have adapted optometry laws, and that only 10 states remain for optometry legislation. These states will be sure, before long, to adopt laws, and there seems little left for ophthalmologists to do, but to become reconciled to new conditions, and to make the best of them. Let us at least see that the laws are observed.

7 W. Madison St.

Book Reviews

The Nervo-Muscular Mechanism of the Eyes and Routine in Eye Work.—Savage, G. C., M. D.

In this little book the author presents two papers, the first of which, *Nervo-Muscular Mechanism of the Eyes*, was read before the Eye, Ear, Nose and Throat Section, Southern Med. Association, ninth annual meeting, Dallas, Texas, Nov. 8-11, 1915, and the second, *Routine in Eye Work*, was the chairman's address before the Section on Eye, Ear, Nose and Throat, at the annual meeting of the Tennessee State Med. Association, Knoxville, April, 1916.

It is well known that Savage considers Myology the most important branch of Ophthalmology and it is not surprising to find him very positive in his statements. In the paper on muscles he first defines poles, planes, equator, etc., and states the "true law of visible direction" as follows: "All lines of direction are axial rays of light and cross each other at the nodal point."

Helmholtz, according to Savage, had a false conception of this law and made a fatal mistake in his location of the anterior and posterior poles of the eye ball, which resulted naturally in a faulty location and construction of the equator and corneo-retinal meridians. Savage holds that the centre of the macula should always be the posterior pole of the eye, while Helmholtz locates this pole by passing a straight line from the centre of corneal curvature through the centre of rotation to the retina, this point coinciding with the central point of the macula in ideal eyes.

The nuclear connections of the extrinsic eye muscles are gone into in detail, together with a description of the nine conjugate and twelve fusion brain centres which regulate binocular rotation.

Monocular rotation is also fully considered and the author emphasizes the anatomical and neurological basis for the principle of monocular examination in muscle work; a principle for which he has long contended. In this connection his monocular phorometer is well known.

The introduction to the paper on *Routine In Eye Work* is a plea for better and more uniform preparation of future ophthalmologists and for a national board of examiners.

In the description of his office routine he discusses methods of handling patients, charges, advantages of the Keller registration book which he finds very satisfactory, touches briefly the differen-

tial diagnosis of a number of conditions frequent in office practice, and finally describes in detail his method of procedure in refraction and muscle testing, again calling attention to the necessity of a careful MONOCULAR examination of the extrinsic eye muscles.

This paper is well written in a conversational, interesting style and contains much of value to the beginner as well as to those more advanced, who already have a definite routine worked out.

Albert F. Mattice.

Homeopathic Therapeutics in Ophthalmology.—Moffat, John L., M. D. President 1912, Homeopathic Med. Society of the State of New York, Vice-President 1905-08, Amer. Homeopathic, Ophthalmological, Otolological, Laryngological Society, etc. Published by Boericke & Tafel, 1916, Philadelphia.

To the average reader not trained in homeopathy this little book will prove very interesting as an authoritative exposition of homeopathy applied to ophthalmology.

Homeopathy, as we know is founded on the theory that all cases of constitutional disease curable with medicine will be cured by small doses of drugs, the administration of which in larger doses would cause in the healthy body symptoms similar to those manifested by the disease actually present. It would seem rather difficult to apply this principle broadly to ophthalmology, yet the homeopathic ophthalmological *Materia Medica* is quite extensive, the different remedies being described as follows:

Objective: Eye signs caused by administration of large doses of the drug. *Subjectives* Eye symptoms caused by large doses in the healthy subject. *Characteristics:* General appearance of a healthy person after a large dose of the drug. *Clinical:* Diseases and symptoms which are relieved or cured by medicinal doses of the drug.

In running through this *Materia Medica* one is struck, first by the large number of remedies unknown to regular practice, and second, by the entirely different conception of some well known drugs. Take for instance Belladonna. The clinical indications are given as follows: "Its use in inflammatory disease of the eye is more limited than is generally supposed. It has been most valuable in diseases of the fundus. Is one of the chief remedies in optic neuritis, retinitis, has relieved iritis, early stages of catarrhal conjunctivitis and the severe pains of glaucoma (do not give material doses here lest the condition be made worse)." Just what a material dose of Atropine is considered to be is not stated. Under Jaborandi, whose alkaloid is Pilocarpine, we read: "One of our

valuable eye remedies. Norton recommends it for serous choroiditis and for recent periodic convergent squint not dependent upon weakness of the opposing muscle." *Physostigma Venosum* (Alkaloid Eserine) is recommended for Myopia due to or increased by ciliary spasm. Glaucoma is not mentioned.

Among the remedies not common in regular practice is *Pulsatilla* (wind flower), described as a very valuable remedy frequently called for, its selection being largely governed by the temperament and general symptoms. People needing *Pulsatilla* are mild, gentle, tearful patients, usually blondes, often females. To negroes give *Pulsatilla* if no other remedy is clearly indicated.

Lycopodium (Club Moss) has arrested the progress of cataract when prescribed for chronic dyspeptic symptoms and has cleared up vitreous opacities.

Sepia (Cuttle fish ink) is valuable in acute catarrhal conjunctivitis, spring catarrh of the conjunctiva, and in trachoma with or without pannus, especially in females addicted to tea. When properly indicated it has checked the progress of cataract and improved vision.

There is a very complete clinical, symptom, and sign index, where, opposite a given eye disease, sign or symptom one may find the proper drug to administer. Some of the conditions which can be cured or relieved medicinally are cataract, amblyopia, detached retina, diplopia, glaucoma (without myotics), hemianopsia, keratoconus, optic nerve atrophy, pterygium and strabismus.

Forty-three separate varieties of eye pain are mentioned each with its appropriate remedy according as the pain is aching, biting, crawling, crushed, raw, screwing, twisting, unbearable, etc. If she sees fiery points wherever she looks give sodium muriate or picric acid. As a good example of how completely this index aids the practitioner the following may be quoted: When near objects look smaller if one eye is covered give *Belladonna*; if objects appear to approach and recede alternately, give *Cicuta Maculata*; appear crooked, *Belladonna*; covered with rainbow colors, *Bryonia*; shaded, *Senega*; dance with each pulsation, *Glonoin*; look bluish, *Trillium*; whirl, *Picric Acid*. If the patient thirsts for frequent small drinks give *Arsenicum Album*. Note by reviewer: If the last mentioned remedy is really efficacious it might help to solve the drink problem in Washington State.

From the above very incomplete review it can be readily seen that this book viewed from the homeopathic standpoint presents

its subject matter in a thorough concise manner and makes of ocular therapeutics a very formidable weapon against disease.

Those accustomed to regular ocular therapeutics will also find the book unusually interesting and will realize more fully perhaps the shortcomings of their own medical armamentarium.

Albert F. Mattice.

The Medical Annal: A Year-Book of Treatment and Practitioners' Index.—1916, 34th year, Bristol. John Wright & Sons, Ltd. Price 10 shillings net.

The annual for 1916 maintains its high place as in former years but this year naturally gives more attention to military subjects, yet at the same times does not neglect the needs of the general practitioner. The ophthalmic surgeon will find many articles of value, that especially relating to eye injuries which occupies five pages, by Mr. Hugh Thompson, is one of the best. The editor deserves our best thanks for the high standard of the work and as usual the letter-press illustrations are of the highest order. Is any who desire to keep abreast of the times the work is invaluable.

A. A. Bradburne.

Notices

December 22, 1916.

An Ophthalmological Service has been added to the other departments of Bellevue Hospital, New York. It is located in the new surgical pavilion but is entirely distinct from the rest of the hospital, having its own operating, examining and dressing rooms, a staff of attending surgeons, special internes and nurses; its capacity for the present will be 50 beds. The service is in charge of Dr. Charles H. May, attending surgeon, who will have as his principal assistants Drs. Julius Wolff and John M. Wheeler.

At the twenty-fifth annual meeting of the Chicago Ophthalmological Society, held January 15, 1917, the following officers were elected to serve during the ensuing year:

President—Dr. Paul Guilford.

Vice-President—Dr. Francis Lane.

Secretary and Treasurer—Dr. Major H. Worthington.

Councilor—Dr. G. W. Mahoney.

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THE EARLY HISTORY OF OPHTHALMOLOGY IN CHICAGO*

CASEY A. WOOD
CHICAGO

The two decades preceding the year 1877 are so intimately connected, ophthalmologically, with the career of the late Edward Lorenzo Holmes and his contemporaries that an account of their professional life furnishes the best history of the early developments of our specialty in the western part of this country. It is the purpose of this paper to dwell somewhat upon the activities of these half dozen men, who really laid the foundations of ophthalmic practice as we now know it in this part of the United States.

Dr. E. L. Holmes was born at Dedham, Massachusetts, in 1828. He received his B. A. degree from Harvard in 1849; his medical degree at the same university in 1854. After occupying the position of interne in the Massachusetts General Hospital, making there a special study of ophthalmology and otology, he proceeded to Europe where he further studied for over a year and a half. Coming to Chicago in 1857—just sixty years ago—he settled in the western metropolis and practiced here almost up to the time of his death, in 1900. It may be said that during this whole period there was hardly a medical movement in the state of Illinois that was not more or less completely associated with the name of Dr. Holmes. Apart from the influence generally exerted by this remarkable man, the founding of the Chicago Charitable Eye and Ear Infirmary was, perhaps, his most notable achievement. In May, 1858, he, with the assistance of a few others, established this institution at the northeast corner of Michigan Avenue and Clark Streets. In 1862, it was removed to 28 North Clark Street, and in 1871 the legislature, by special act, made it a state institution

*An address delivered at the annual meeting of the Chicago Ophthalmological Society, January 15, 1917.

and changed its name to the Illinois Charitable Eye and Ear Infirmary. On October 9, 1871, it was totally destroyed by fire, but in a building rented and occupied on North Morgan Street in 1872, the good work was continued. In 1874, the present building, at the corner of Peoria and Adams Street, was erected and has been the home of the institution ever since. From the third annual report of the infirmary, kindly secured for me by Dr. Francis Lane, I note that Daniel Brainard and Joseph W. Freer were associated as consulting surgeons with Edward L. Holmes and Edwin Powell in the treatment of patients. The report for the year ending May 1, 1861, shows that 237 ophthalmic cases were treated. As we are always inclined to think that so-called modern methods are the especial property of ourselves alone, let me point out that in this report of nearly sixty years ago, much of the introductory space is taken up in drawing the attention both of the profession and of the laity to the prevention of blindness through the prompt treatment of ocular affections in children. "The young," runs the report, "require full powers of vision, since upon it they depend for the rudiments of knowledge they acquire, whether it be of the elementary branches taught at school, or of the occupations by which they must, so early in life, gain their own support. Unless means are provided for the relief of these patients, many of them are often left to grow up in idleness and ignorance, and become for life a burden to their friends or the public."

This report also draws attention to the fact that the dispensary of the infirmary, then situated in Ewing's Block, corner of North Clark and North Water Streets, "is open daily from 11:30 to 1 o'clock for the gratuitous treatment of the poor afflicted with diseases of the eye and ear."

And so the infirmary continued during its founder's life and since to do the magnificent work with which we are all of us familiar. The growth of this institution may, in a degree, be realized by comparing the report from which I have just quoted with the 29th Biennial Report, issued on October 1, 1914, which states that between 16,000 and 17,000 eye cases had been annually treated in the dispensary and in the hospital proper during the previous year. The surgical staff has also grown to keep pace with the increased demands for competent officials, and we find the consulting staff, surgeons, assistant surgeons, pathologists and internes now number over sixty. As I am not now a member of this staff I may be permitted to say that, in my belief, there are few institutions in the country where more or better ophthalmic and oral surgery is

done, where more successful major operations are performed and where the details of diagnosis and treatment are more faithfully carried out.

The establishment in our medical colleges of professorships of ophthalmology and otology as distinct from general surgery is, to some extent, an index of the value attached by the medical public to these specialties. I find that Rush Medical College appointed E. L. Holmes lecturer on these subjects as early as 1860 and that in 1867 he received the full professorship—a position which he filled with distinguished ability until his resignation in 1898.

Another worker in the field of diseases of the eye, to whom early Chicago ophthalmology owes a debt, is John Sullivan Hildreth. He was born at Cohasset, Massachusetts, on May 1, 1832. As an American graduate he became a student of Desmarres in Paris about 1861. He also studied two years in Berlin under Virchow. The records of the War Department show that he was in 1863 appointed surgeon of the United States Volunteers, stationed in Chicago. When, in the summer of 1863, the Chicago City Hospital was occupied by the United States Military authorities, Surgeon J. S. Hildreth was attached to it. In July, 1865, we find Hildreth in full charge of this institution, but the scope of treatment was limited to diseases of the eye and ear and the name of the hospital was changed to the Desmarres Eye and Ear Hospital. Its location was at the corner of 18th and Arnold Streets; capacity, 130 patients, and it boasted 40 attendants of all ranks. In 1866, it was merged in, or, rather, became the Cook County Hospital. Dr. Hildreth was the first professor of ophthalmology and otology in the Chicago Medical College, being appointed consulting ophthalmologist and otologist to its medical staff.

Another pioneer ophthalmologist that must not be forgotten in this partial sketch of Medical Chicago is Sigismund Daniel Jacobson. He was born at Copenhagen, Denmark, the son of an influential merchant of that city, on February 14, 1837. He was thoroughly and liberally educated—no mean advantage for a future ophthalmologist. We are told that among the personal friends of his family were Bartholdi and Mendelssohn. He was admitted to the University of Copenhagen and at that institution took a degree in philosophy in 1856, after which he began the study of medicine in the same university. At this time he was gaining practical experience in the Royal Frederick Hospital, serving in the different wards from 1857 until 1862, when he graduated. He was then

appointed house physician for two years. At the opening of the Schleswig-Holstein war in 1863 he was appointed surgeon of the 13th Infantry and served until May, 1864, when he was given charge of a field hospital. At the close of the war he began the practice of ophthalmology in Copenhagen and became assistant to Hansen Grut, the eminent ophthalmic surgeon. On the 18th of October, 1866, he sailed for America and on November 7th landed in New York, and soon after established himself in Chicago as a general surgeon, making ophthalmology and gynecology prominent features. In the spring of 1871 he decided to devote his whole time to ophthalmology, and so established a private hospital and clinic (after the style of the European Poliklinik) at 303 Wabash Avenue, for the treatment of diseases of the eye. As in the case of other medical buildings of the city, the great fire of that year consumed it with all his belongings. Nothing daunted, he again resumed general practice, but always giving especial attention, and with marked success, to diseases of the eye. He was ophthalmic surgeon to Cook County Hospital from July, 1878, to June, 1885, and was elected to the medical staff of other well-known Chicago hospitals. Rush Medical College honored him in 1881 with the degree of M. D. In the summer of 1889, having become alarmed about his failing health, he resigned all his professional connections and returned to Copenhagen for rest and recuperation; but his health continued to fail and he died in his native city on February 23, 1894.

Another pioneer ophthalmologist who did good work in the early days of this city was Samuel Jones Jones, who settled here in 1868 and in 1869 established a department in St. Luke's Hospital for treatment of the diseases of the eye and ear. Dr. Jones was born at Bainbridge, Pennsylvania, on March 22, 1836. He received his B. A. degree in Dickinson College in 1857 and his M. D. degree at the University of Pennsylvania in 1860. As a naval surgeon he took part as a Federal officer in the memorable engagement at Hampton Roads with the Merrimac. He resigned in 1868, after having been promoted to the rank of full surgeon.

He then studied ophthalmology and otology in Europe and on his return to America settled in Chicago, where he was soon made professor in the Chicago Medical College, succeeding Dr. Hildreth in that position. He was, for several years, editor of the *Chicago Medical Journal and Examiner*.

Still another famous Chicago ophthalmologist was Ferdinand Carl Hotz. Born at Wertheim in Baden, July 12, 1843, he re-

ceived his medical training mostly at Heidelberg and Berlin, his teachers being chiefly Helmholtz, Knapp, Graefe, Virchow and Langenbeck. He came to America and settled in Chicago in 1869. At first Hotz practiced as a general surgeon. Indeed, it may here be said that without exception the early Chicago ophthalmologists were general surgeons giving, however, particular attention to diseases of the eye and ear.

It is not the intention of this paper to deal extensively with the life and works of Ferdinand Hotz, mainly because his career is well known to most of you. It is only necessary to say that he was a versatile, contentious, and often hot-tempered man, but an uncompromising hater of shams and quackery, and that he never hesitated to give a frank, sincere opinion upon any subject in which he was interested. Ophthalmology the world over lost a good friend when Hotz died.

This list of early ophthalmologists would be more incomplete than it is if no reference were made to the career of two excellent surgeons, who, by meritorious work, gained and held the respect and confidence both of the profession and of their numerous friends and patients. I refer to Drs. Woodyatt and Vilas—the latter still living, although not now in active practice.

These gentlemen practiced in an era when the lines—now happily indistinct, if not entirely erased—between sectarian homeopathy and, I may add, sectarian “allopathy” were clearly drawn. For that reason, perhaps, those of us who belong to the so-called “regulars” did not know as much of our homeopathic brethren as their merits deserved. However that may be, the present advance on both sides to an enlightened eclecticism was comparatively easy in the case of a largely surgical specialty like ophthalmoscopy; there were, nor are there, any burning questions of, let us say, *similia similibus*, brachial venesection, third dilutions or two-ounce doses of castor oil in the treatment of hyperopic astigmatism or the removal of a meibomian cyst. Hence it is and has been no difficult task for enlightened homeopathic and “regular oculists” to break down the barriers of medical caste and, in the true Esculapian spirit, “get together” for the advancement of their common specialty.

Wm. H. Woodyatt, born in 1816, graduated from the Cleveland Homeopathic Medical School about 1868. He then spent two years in New York in attendance upon the various eye and ear clinics there, and was a student under Hermann Knapp for most of this time at the New York Ophthalmic and Aural Institute.

He also graduated from the Homeopathic New York Ophthalmic College. He then emigrated to Chicago and settled here in the early part of 1870. He almost at once acquired a large practice and gave a good deal of his time to the teaching of ophthalmology and otology in Hahnemann College until about 1874, when, with Dr. Charles Adams and others, he founded the Chicago Homeopathic College in which he worked and taught until his death on the 31st of January, 1880.

Having the advantage of preparation in the best colleges and under both systems of medicine and having been endowed by nature with unusual qualities, Dr. Woodyatt became known far and wide, and was regarded as one of the most reliable diagnosticians and ophthalmic operators in the west.

Chas. Harrison Vilas was born in 1846, in Chelsea, Vermont, and graduated at the Chicago Hahnemann Medical College about 1873. He subsequently did post-graduate work in New York, was associated for a time with Valentine Mott and shortly after was made Professor of Ophthalmology and Otology by his alma mater. He made many trips to Europe for study and observation, spending considerable time in the Royal London Ophthalmic Hospital. He published, before 1880, three works on ophthalmology, among them a text-book on Diseases of the Eye, mostly outlines of his lectures to students. He practiced in Chicago until about ten years ago, when he retired and is now living in Madison, Wisconsin. He is regent of the State University of Wisconsin, from which he graduated many years ago.

On this, the 25th anniversary of the founding of our beloved Chicago Ophthalmological Society, it seems appropriate for me to say something about the foundation and early history of an association so intimately bound up with my subject yet it really lies without the purview of this address, and belongs to the period reviewed by my colleague, Dr. Wilder. Moreover, a brief history of the society edited by myself, will be found as an introduction to the Constitution and By-Laws. There is, however, one matter to which I would like to direct your attention. We have still in our midst three gentlemen who form a sort of connecting link between the early past and the living present of Chicago ophthalmology. Your and my valued friend Dr. W. T. Montgomery is the oldest living president of this society. He occupies an enviable and unique position amongst us because not only on that account but because he is, so far as I know, also the dean of those surviving ophthalmologists and otologists who constituted the first Chicago

Ophthalmological and Otological Society that originally met as such about 1880. With him should be bracketed the names of two others, our honored associates Drs. J. Elliott Colburn and Edwin J. Gardiner. All the other members of the first Chicago Ophthalmological and Otological Society have passed away. I may add that Dr. Gardiner was the first of our members in Chicago to confine his practice from its inception to diseases of the eye and ear, it being the custom, as I have said, in the early days to combine ophthalmology and otology with the work of the general practitioner. Finally, Dr. Colburn represents, if my memory properly serves me, the inception of a most important though perhaps not a very early agent for the dissemination of ophthalmic knowledge, the graduate or post-graduate medical school.

Another of our ex-presidents, Dr. Franklin Coleman, who was largely instrumental in founding the first school of the kind in the west—the Chicago Polyclinic, an institution that still continues to flourish and to do good work.

As we have seen, Cook County Hospital has not only had a vigorous and flourishing ophthalmic and aural department since its foundation in 1866, but it really grew out of a special hospital devoted to the care of diseases of the eye and ear presided over by a large and competent staff.

It is superfluous for me to draw your attention to the excellent work now being done in this, now among the largest, if not the largest, municipal hospital in the world. Although the full development of its Eye Department is comparatively recent, yet I would like to point out to you that many men in this room have given of their energies to the establishment and successful conduct of the present extensive ophthalmic department that had its origin in similar work initiated there nearly 50 years ago.

Time will not permit a review of all the other general hospitals now well equipped with an ophthalmic staff, except to point out that in respect of them, as in the early days, so now, Chicago ranks in the matter of ophthalmic equipment, with any city in this country.

Your orator has ever been of the opinion that the history of medicine is incomplete without a consideration of the so-called irregular practitioners of medicine, including quacks without and empirics within the regular profession. Whether we like it or not it is quite impossible in a history of ophthalmology to draw the line between those whose skirts are entirely free of the empiricisms of the day and those whose ethical imperfections lie thick upon

them. Thus, while early ophthalmology quite properly boasts of its prophets and martyrs who kept the faith yet it had also its Chevalier Taylors who, picturesque though they were, treated the practice of medicine as simply a commercial proposition. We had such in the early medical history of Chicago and I am tempted to refer to one who while he shall be nameless here is probably known, in at least a traditional way, to some of you. This man, half oculist, half optician, chose Chicago as his headquarters and made more or less regular journeys into the outlying country for the purpose of fleecing the not unwilling inhabitants. He was no peddler of cheap glasses but an aristocrat who moved about in first class style. He generally traveled from place to place in a coach-and-four, accompanied by all the equipment that properly goes along with that means of locomotion. Occupying the best rooms in the best hotels and his visit heralded by effective advertisements, he was able to sell glasses made from his "special form of quartz pebbles" whose action upon the eye was not only mystic but marvelous. The frames of these wonder-working spectacles were especially prepared for his patients and were engraved in the highest style of art. He generally advised his non-presbyopic patients to wear three pairs of these miraculous pebble glasses, whose refractive power, by the way, was usually a quarter, a half and three-fourths of a diopter, and for which I have known him to receive the sum of \$200.00. It was not an uncommon thing for him to sell many such pairs of glasses in the city of Chicago for \$50.00 each.

This experience is, however, no worse than a more recent example of quackery *within* the profession, when a "regular" ophthalmologist cured or quite cheerfully agreed to cure some of our very best people of diabetes, Bright's disease, laryngeal tuberculosis and chronic dementia by the simple expedient of operating on their eye muscles. The "operation," by the way, generally consisted in loosening up the subconjunctival connective tissue about the tendinous expansion of these muscles, but he did sometimes succeed in making an actual partial or complete tenotomy. The operative treatment to which this gentleman subjected his patients was almost invariably supplemented by glasses, always, like those of his optician prototype, of the rare and wonderful kind. In many instances, not to prolong this narrative, he ordered a special pair to be worn at night lest the patient, awakening, should be adversely affected by rays of light from an accidental source, such, for instance, as might find its way through a neighboring transom!

Thus, you see, the work of the ophthalmologist in early Chicago days probably did not essentially differ from that which my colleague, Dr. Wilder, will tell you is going on at the present time, and which will probably continue to be done in the future.

Indeed, the same great river of knowledge, of light and of truth flows on, narrow at its source, ever broadening towards its mouth. I have just been sitting, an obscure observer, on its banks, watching the waves and trying to speak to you of a few travelers, even like ourselves, who, embarked on its surface, have journeyed or are journeying to the Nirvana—to that Ocean where as you know the dew drop of our brief day “slips into the silent sea.”

THE SMITH-INDIAN CATARACT OPERATION ILLUSTRATED BY MOVING PICTURES*

A. S. GREEN, M. D., AND L. D. GREEN, M. D.,
SAN FRANCISCO, CAL.

The Smith-Indian intra-capsular cataract operation has been the subject of a great deal of literary discussion in which the descriptive and diagrammatic details of the technique have been given minutely, yet we still find that misconceptions frequently exist as to the various steps of this procedure.

As the privilege of actually witnessing the operation is of necessity open only to few, it occurred to the writers that a moving picture demonstration of the operation as performed upon the living subject would be of interest and of value in showing the exact details of the technique.

The illustrations here shown are enlargements from selected negatives of a film so taken: they represent distinctive steps of the operation and are chosen to emphasize details of importance. In the original film there are sixteen pictures to the foot, and from two to three hundred feet are necessary to show a complete operation, the length of film required depending on the amount of detail one desires to show. The exposure was by daylight with the camera above and to the right of the patient and at a distance of about two feet. The pictures show the operative technique without deviation exactly as followed by Colonel Henry Smith of Amritsar, India, from whom we learned it; we have, however, substituted for Smith's lid hook and speculum the speculum designed by us, the advantages of which have been pointed out in a former paper.

In order to convey a consecutive impression of the operation we will give in detail our manner of handling the patient from the time of the first examination to his discharge from the hospital.

Regarding the preliminary examination it may be said that in this country we have ample time to satisfy ourselves prior to operation as to the patient's condition, but the great stress of work in Smith's clinic does not permit him to devote much time to pre-operative investigation. His trained eye, however, enables him to form a judgment based on his extensive experience, which is generally found to be more than sufficient regarding the prognosis of the case.

Enlarged reproductions from moving pictures exhibited at the meeting of the A. M. A. in Detroit June, 1916, and before the Pacific Coast Ophthalmological Society the same year.

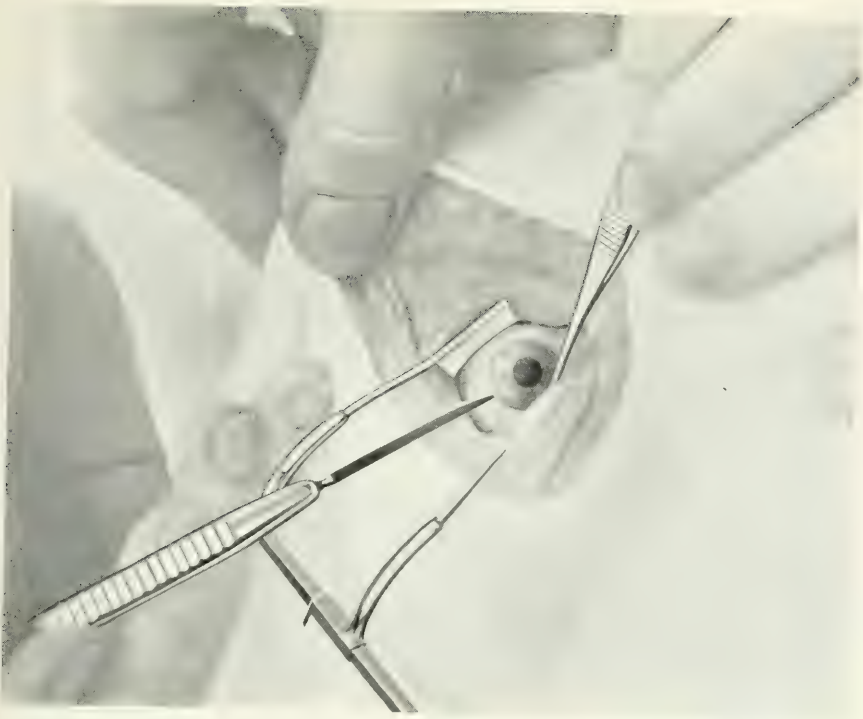


PLATE 1—Making the puncture.

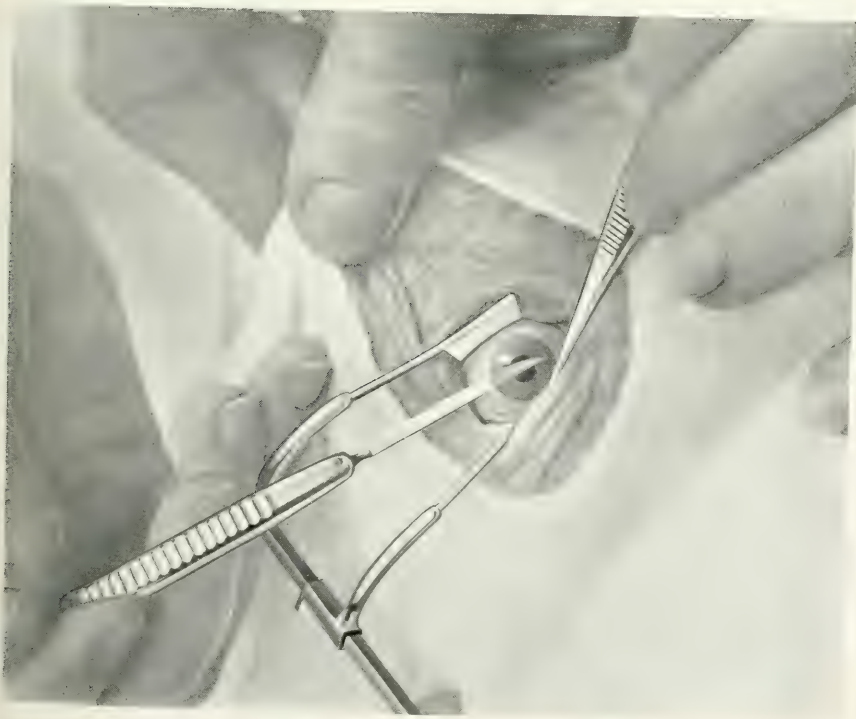


PLATE 2—Knife carried across anterior chamber.

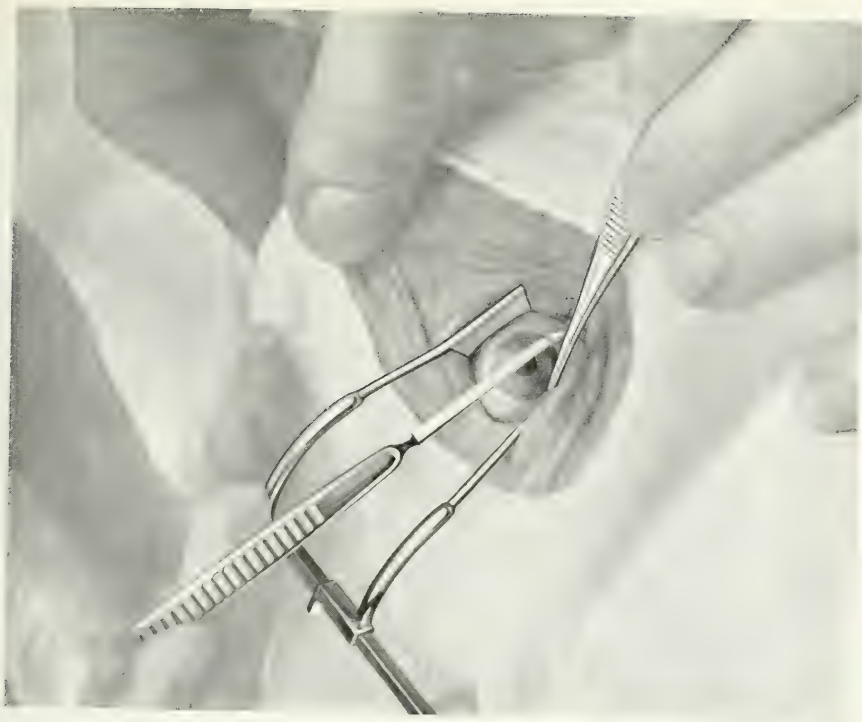


PLATE 3—Knife making counter-puncture.



PLATE 4—Completing the incision.

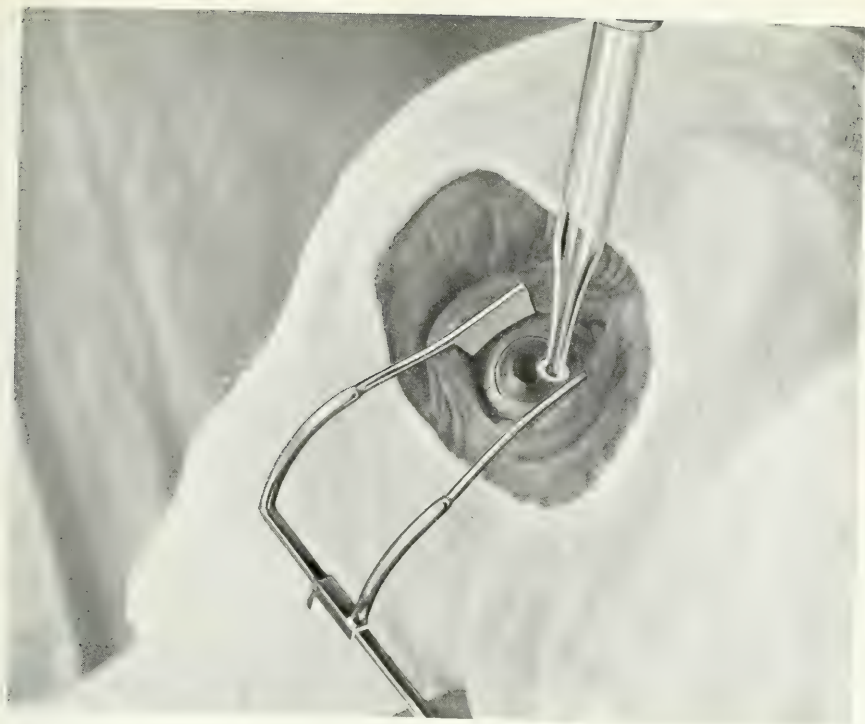


PLATE 5—Withdrawal of fluid. Note incision is limbal and not corneal.



PLATE 6—Excising the iris, cutting sidewise; see reason for this in text.

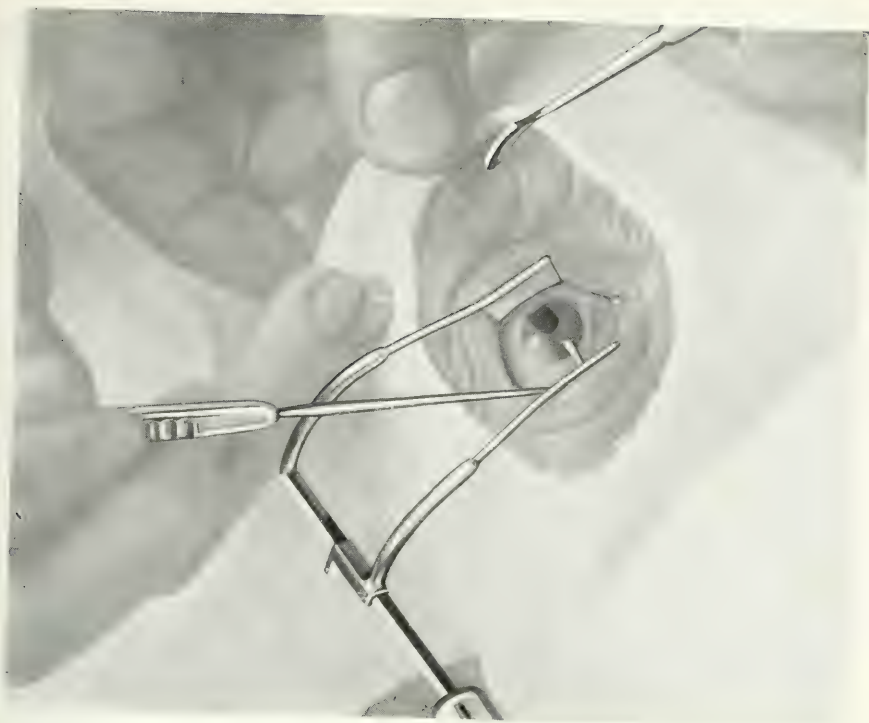


PLATE 7—Spoon held in readiness. Delivery hook in position ready to begin pressure.

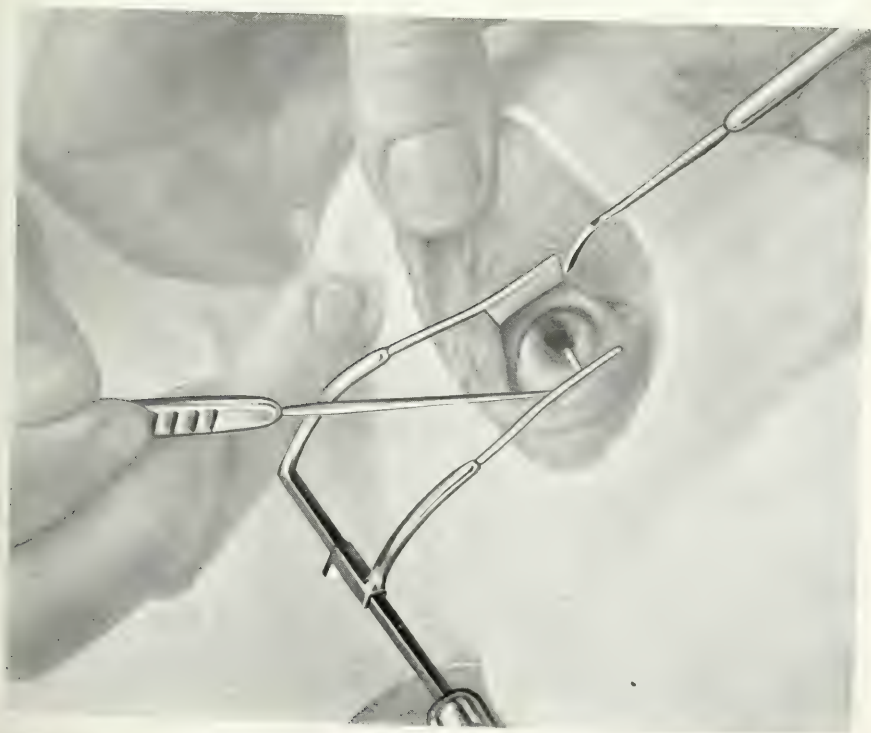


PLATE 8—Delivery hook applying pressure toward optic nerve. Wound beginning to spread.

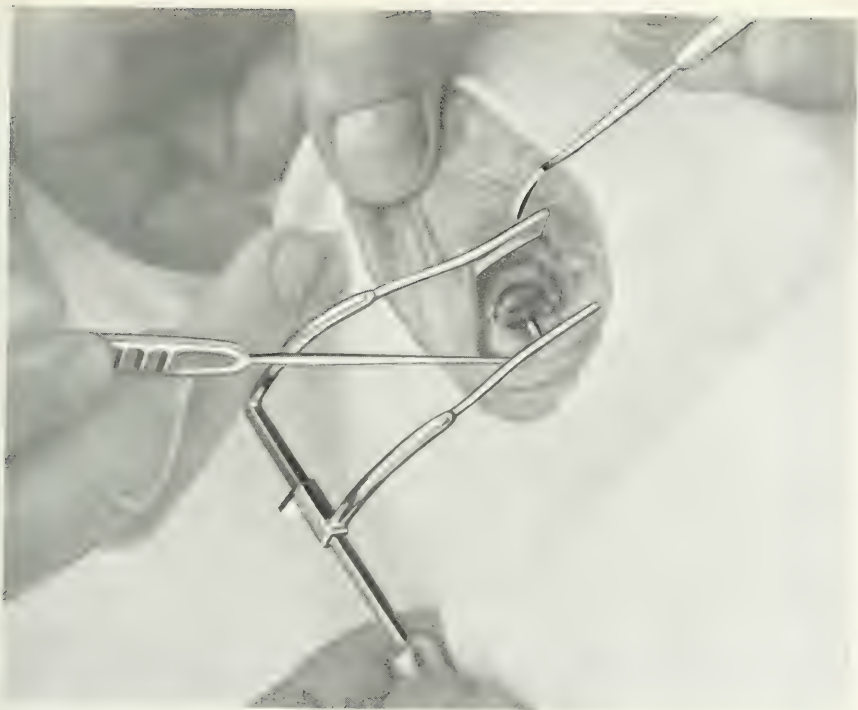


PLATE 9—Pressure continued; cataract appears at mouth of wound.

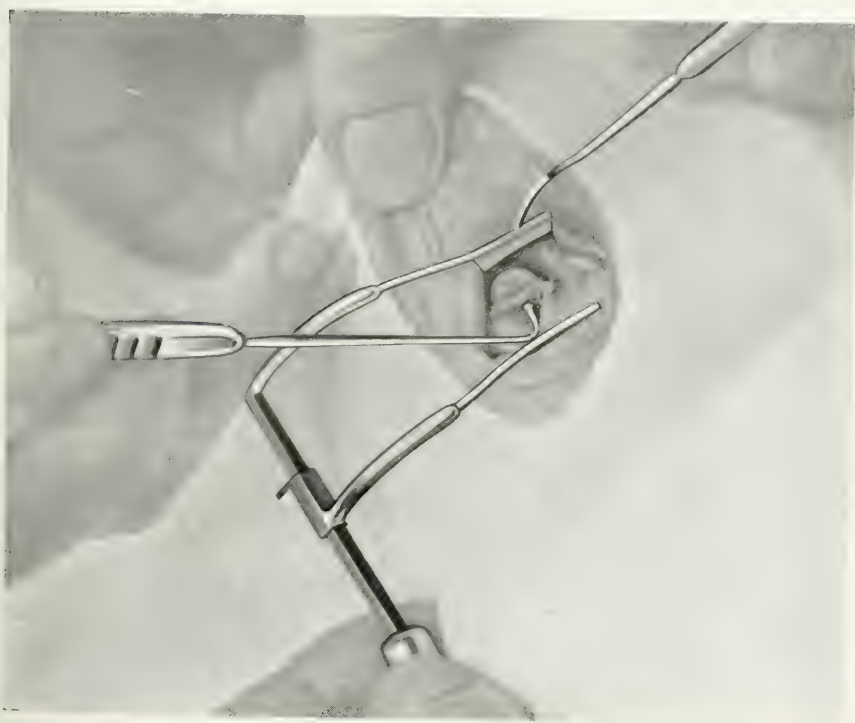


PLATE 10—Elbow of hook raised to alter direction of pressure, upward and backward.

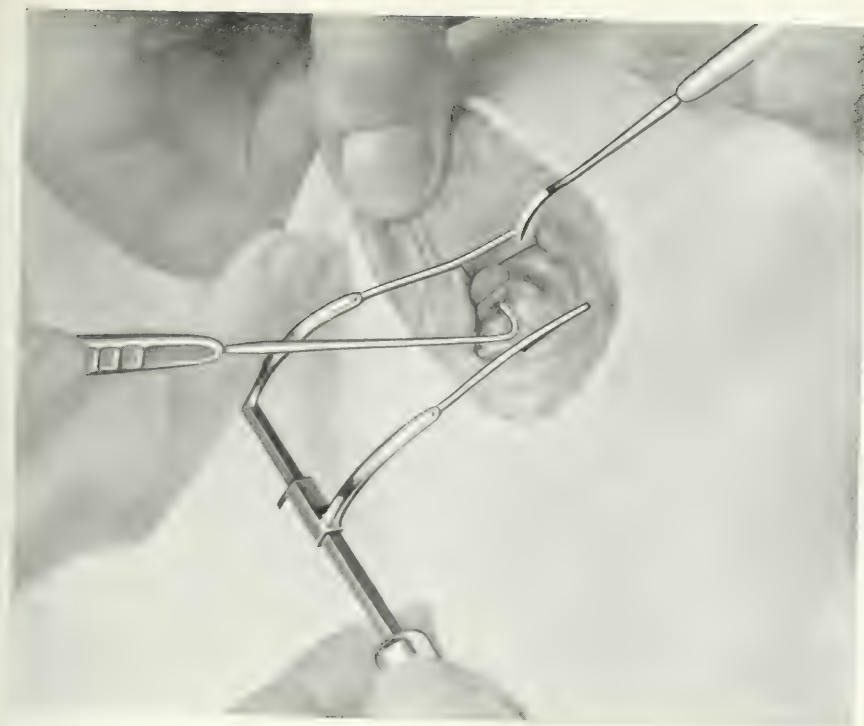


PLATE 11—Carrying hook toward wound; tucking corner underneath lens.

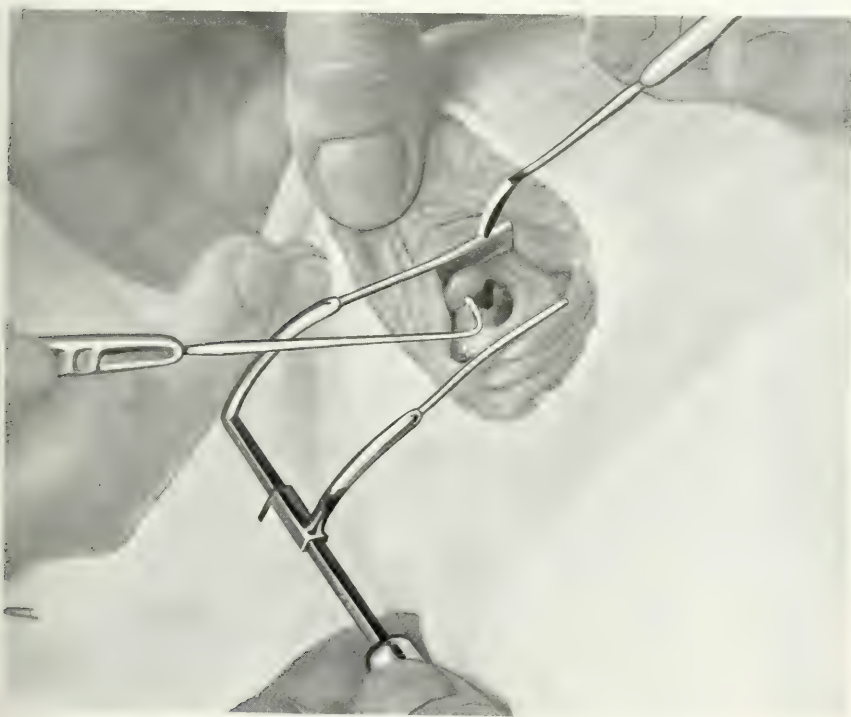


PLATE 12—Lens lying outside wound.

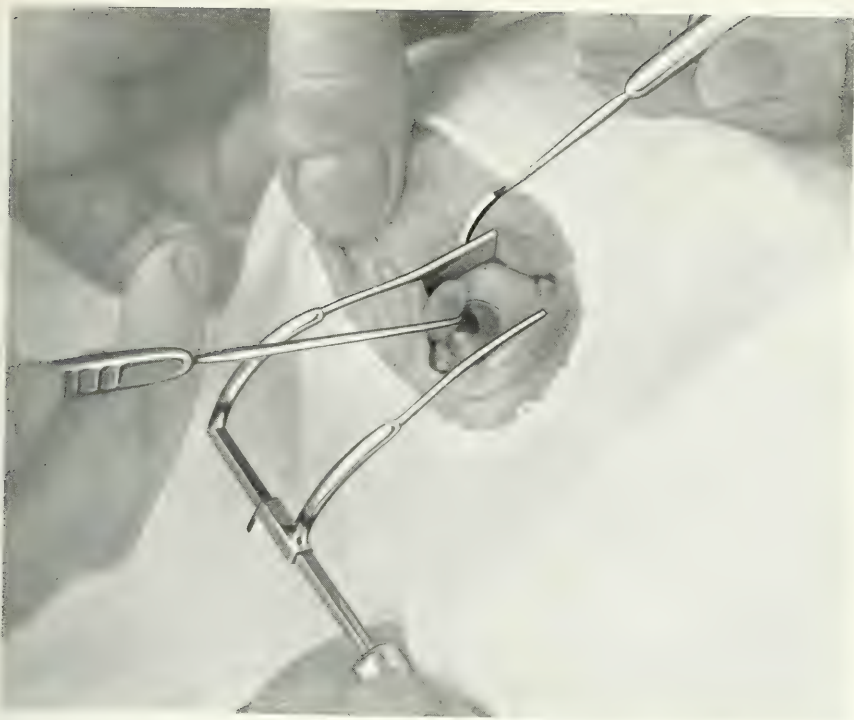


PLATE 13—Elbow of hook teasing lens away from wound.

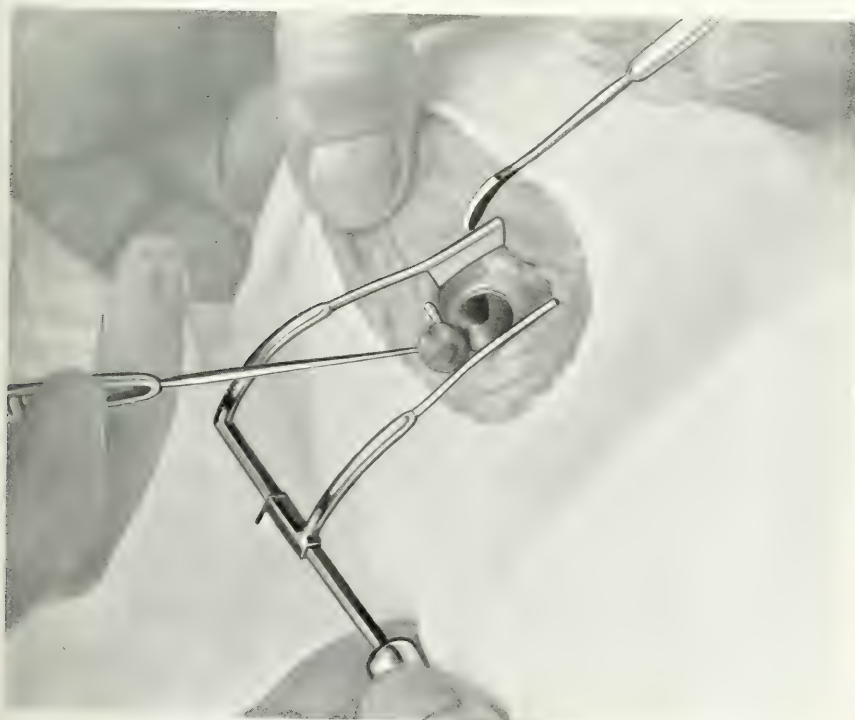


PLATE 14—Rolling lens to external canthus with hook.

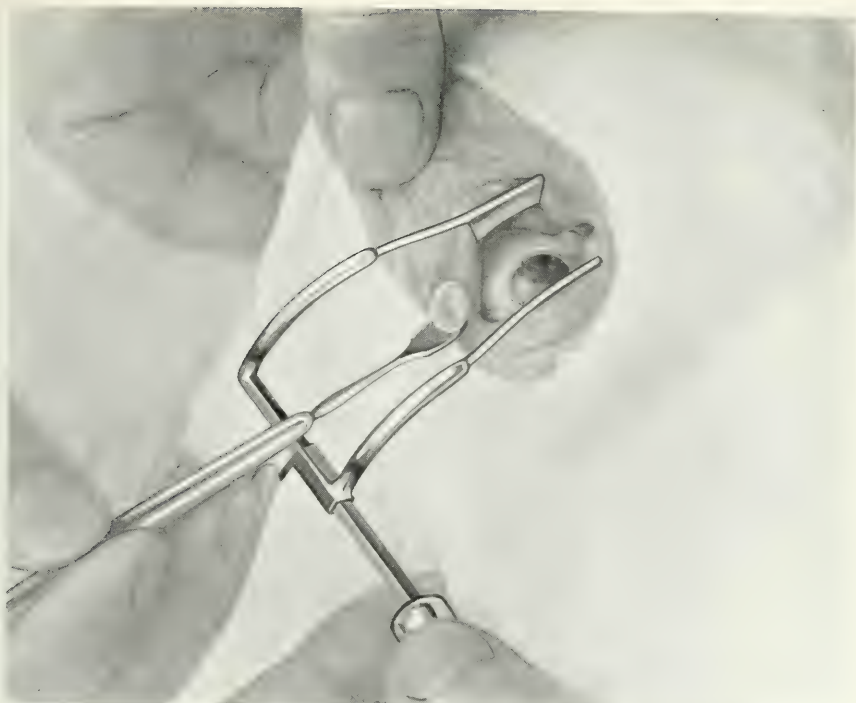


PLATE 15—Lens lifted away with spoon.



PLATE 16—Repositor about to enter inner angle of wound to replace pillars of iris.





PLATE 17—Repositor about to enter outer angle of wound to replace pillars of iris.

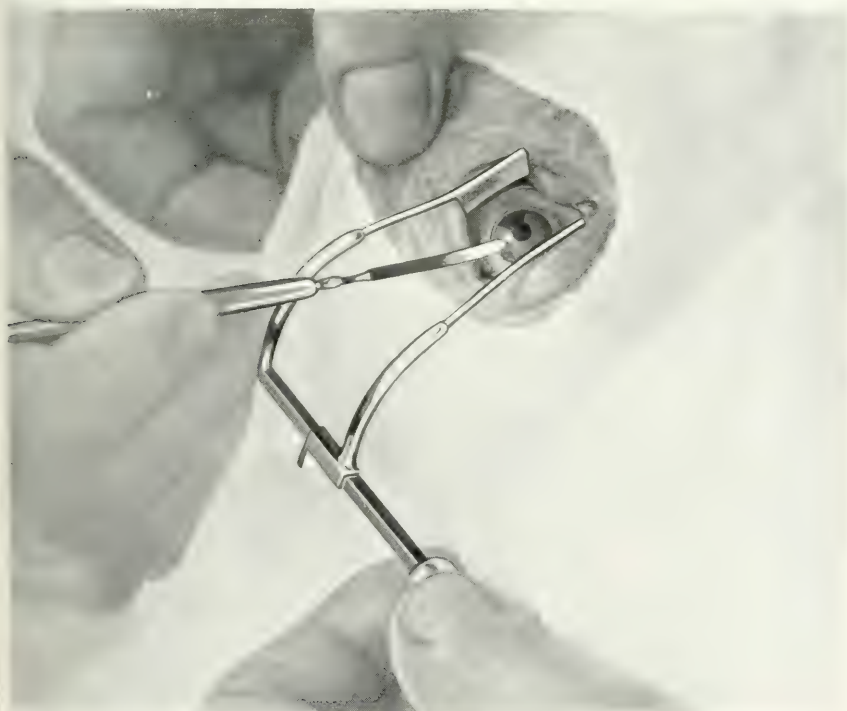


PLATE 18—Smoothing edges of wound with rounded end of repositor.

Examination of Patient Before Operation.

1. The vision of each eye is taken and recorded.
2. The lids, conjunctiva, and lachrymal apparatus are examined. If diseased they are treated until the danger from infection is reduced to a minimum. If dacryocystitis exists the sac is extirpated provided the condition cannot be remedied by more conservative methods.
3. The size and clearness of the cornea are noted. The size is important, as in a small cornea with a large lens greater difficulty will be encountered in delivery.
4. The activity of the pupil may indicate some fundus changes, and where the pupil is less active than normal we must be more guarded in prognosis as to the degree of visual acuity to be expected. In many cases a low post-operative degree of vision is due to degenerative changes in the fundus while the result surgically may have been perfect.
5. The cataract is noted for its maturity, whether swollen or not, and whether or not we expect it to be a "tumbler."
6. The vitreous is examined for floating opacities if the density of the cataract is not too great; this is also of great importance as to the degree of subsequent vision. We are always suspicious of fluid vitreous in these cases, and consequently of a greater liability to vitreous loss.
7. The fundus is carefully examined where possible, preferably under a mydriatic; degenerative changes here may not only interfere with good subsequent vision, but they increase the danger from choroidal hemorrhage during the operation or shortly after.
8. If the cataract is so dense that the fundus is not visible the eye is examined for light perception and projection. Where light projection is faulty, a doubt always is raised as to the advisability of operating, although one must not be misled by the mental apathy or the misunderstanding of some patients.
9. The intraocular tension is taken, first with the fingers and then with the tonometer; if raised suitable treatment must be instituted and a preliminary iridectomy done if necessary. The danger from expulsive hemorrhage is greatly increased in a high tension eye and must not be overlooked.
10. The blood-pressure, the urine, and the general condition of the patient are examined, and if found abnormal appropriate treatment is given until the condition is such that we feel it safe to

operate. We find that a blood-pressure of 200 to 230, or sugar in the urine, are not inimical to good surgical results; however the above conditions are corrected where possible.

Preparation of Patient for Operation.

If the conditions are favorable for operation the patient enters the hospital in the evening to be operated upon the following morning. The brow on the side of operation is shaved on the night before, but no eye dressings are applied. A cathartic is given at bedtime and an enema in the morning. Two hours before operation a dose of forty grains of sodium bromide is administered for its sedative effect.

The Operating Room.

We insist upon an absolutely sterile set-up for the operating room with the aseptic technique that is demanded by the general surgeon; while the operator and assistant do not wear gloves, the instrument nurse is required to do so. All instruments are sterilized by boiling excepting the knives, which are kept in pure lysol; we have demonstrated to our satisfaction with the microscope that knives may be kept in pure lysol for months without injury.

The patient is placed on a stretcher on the operating table, the stretcher being removed after the patient is returned to his bed; the stretcher is divided in the center, the two divisions being held together by a strap which can be pulled out. This allows each half of the stretcher to be removed without disturbing the patient.

As soon as the patient enters the operating room one drop of a 5% cocaine solution is dropped in the eye, and is followed by another drop every five minutes for five doses. With the last instillation a drop of adrenalin is added and the other eye also receives one drop of the cocaine solution to relieve discomfort. During this time the upper and lower lashes have been cut close to the lid margins and the skin of the brow, side of the nose, cheek, and the lids to the very margins are mopped with benzine, then painted with 3% tincture of iodine followed by alcohol, care being taken that none of these solutions enters the eye. The cul-de-sac is next irrigated with a 1-4000 bichloride solution in the typical Smith manner with the Jullundur speculum, which raises the lids away from the globe so that all the conjunctival folds may be reached; this speculum is removed and not again used during the operation. Sterile sheets and towels are put around the patient and a gauze mask with an opening for the operative field is placed over the face; this gauze is first moistened in bichloride solution.

In operating on the right eye the operator stands throughout the operation at the head and a little to the right of the patient, while the assistant stands to the patient's left, holding the Green speculum in his left hand and with his right thumb controls the brow. For the left eye the operator stands to the left of the patient while making the corneal section and changes his position to the head for the following steps of the operation, while the assistant stands at the patient's right throughout the operation, holding the speculum in his right hand and controlling the brow with his left thumb. The operator always makes the corneal section with the right hand for either eye.

The speculum is inserted between the lids and the blades gently separated so that the eye is fully exposed, but without spreading the lids so far apart as to cause pain. The blades are raised sufficiently to avoid touching the eye-ball and the instrument is steadied by supporting the hand holding it, against the cheek of the patient. With his other hand on the forehead, the assistant raises the brow with his thumb which will assist in preventing the patient from squeezing.

The Incision.

While making the incision the operator steadies the globe by grasping the conjunctiva as near the limbus as possible with fixation forceps, drawing the eye downwards toward the feet in order to permit completion of the section at the limbus above. The knife is entered with its cutting edge upward near the limbus at the horizontal diameter of the cornea (Plate 1), carried across the anterior chamber (Plate 2), and the counter-puncture made directly opposite (Plate 3), so that the cornea will be bisected; it will be noticed that the back of the knife is approximately across the center of the pupil. The handle of the knife is then gradually lowered as will be seen by noting its respective positions in relation to the arms of the speculum shown in Plates 1 and 2 when compared with Plates 3 and 4. The blade is then carried upward and sidewise to the hilt, coming out at or near the limbus of the cornea above (Plate 4), the incision being made with one stroke.

In these views the incision was limbal instead of corneal, which is clearly shown in Plate 5. It is more difficult for a beginner to make, however, and it may slightly impede somewhat more than a corneal incision the easy delivery of the lens, but its advantages over the corneal section have led us to adopt it during the past year to the practical exclusion of the other.

After the section has been made the aqueous is withdrawn from the cul-de-sac with a medicine dropper (Plate 5) so that no fluid can enter the interior of the eye. This point cannot be too strongly emphasized, as care must be constantly observed and the fluid withdrawn whenever it accumulates, for no matter how thoroughly the irrigation of the field of the operation beforehand there is always danger from bacteria being carried into the eye should aqueous or blood be allowed to remain about the wound.

The Iridectomy.

The fixation forceps are now handed to the assistant, who relinquishes his hold on the brow. With them he grasps the conjunctiva to steady the globe, at the same time making slight downward traction in the direction of the patient's feet; this permits more room for the iridectomy. In doing the iridectomy the thumb, index and middle fingers of the operator's left hand hold the forceps, while the remaining fingers pull up the brow; this not only steadies the hand of the operator, but will help to prevent the patient from squeezing; the iridectomy scissors are held in the operator's right hand.

Although Plate 6 shows the iris being cut parallel to the corneal incision, done in this case for the purpose of not obstructing the operative field to the camera, the iris is ordinarily cut from below at right angles to the corneal incision.

Removal of the Lens.

In accordance with Smith's technique, the spoon is shown in Plate 7 ready to assist in the delivery of the lens if escape of vitreous is impending, or for use in making counter-pressure at the upper margin of the incision. We have never found it necessary, however, to introduce it within the eye for the delivery of the lens.

Plate 8 shows the Smith delivery hook placed in position and ready to begin applying pressure for the delivery of the lens, while the thumb of the assistant is approaching the brow to raise it. The cataract here illustrated not being a "tumbler," the pressure with the flat of the hook is directed straight down towards the optic nerve; the brow is at the same time raised by the assistant (Plate 8). At this point the handle of the speculum is lowered and the upper blade raised from the globe, lifting the upper lid with it in a tent-like manner to allow room for the exit of the lens, special care being taken not to press on the eye-ball with the lower blade.

As the pressure with the hook continues, the cataract appears at the mouth of the wound (Plate 9). The direction of pressure is

now altered by gradually raising the elbow of the hook (Plate 10), but maintaining the pressure, at the same time carrying the hook towards the wound (Plate 11). While thus following up the pressure the cornea is gradually tucked beneath the lens as it emerges, until the latter is lying outside the wound (Plate 12). The lens is now teased away from the wound by the elbow of the hook (Plate 13), which is then used to roll the lens to the external canthus (Plate 14), it finally being lifted off with the spoon (Plate 15). If fluid has accumulated in the cul-de-sac, it is withdrawn with the medicine dropper as already illustrated in Plate 5.

The next step is to replace the pillars of the iris, using for this purpose the angled end of a repositor by entering it alternately near the points of puncture and counter-puncture (Plates 16 and 17), afterward smoothing out the edges of the wound with the rounded end of the repositor (Plate 18).

Removing the Speculum.

This final step of the operation, the removal of the speculum, is of the utmost importance, and carelessness here may result in expulsion of vitreous. The patient must be informed that the operation is finished and that the instrument is to be removed; that he must not squeeze nor close the lids with any force whatever, but allow them to close in a natural manner gently, as though going to sleep, and to keep them gently closed afterwards.

After making certain that neither blade presses on the eye-ball, the assistant releases the brow and very gently and gradually slides the lower blade of the speculum towards the upper one, constantly on the alert that neither blade touches the globe while he is doing so. When the blades have come together the lower lid is released first and the speculum then removed.

The patient's eyes being thus closed, the instructions as to maintaining them so without squeezing are repeated, and the lower lid is slightly drawn down with the ball of the thumb and yellow oxide of mercury ointment is applied along the lid borders.

The eye-pads are next applied and held in place by strips of adhesive. In order to avoid pressure on the operated eye, a doughnut-shaped eye pad is applied, over which is placed an additional layer of cotton or gauze; over the other eye is placed an ordinary round eye-pad. For further protection a cardboard mask is placed over the pads; bandages are not used because they generally become loose before the end of ten days and produce pressure on the globe as the patient moves his head on the pillow.

These dressings are left undisturbed for ten days, as Smith claims quite correctly that it is unsurgical to tamper with a wound before it is sufficiently healed; on the few occasions that we have deviated from his dictum we have had occasion to regret it.

Post-Operative Care.

After being placed in bed the patient is cautioned against undue movement. Liquid diet is given for the first day and soft or light diet during the remainder of the stay in bed.

The operation having taken place in the morning, the patient is again given thirty or forty grains of sodium bromide during the latter part of the afternoon, this keeping him comfortable and quiet and being conducive to a good night's rest.

On the night of the second day following the operation a cathartic is given, with an enema the following forenoon if necessary.

After the tenth day the dressings are permanently removed and the eye usually found clean with little or no secretion. If any secretion be present it is wiped away with cotton moistened in boric acid solution, and a drop of argyrol or some bland antiseptic ointment is put in the eye. Usually no further medication is necessary, as iritis or other inflammations rarely occur.

A pair of dark glasses with the lower half covered with adhesive plaster to keep the patient from looking down is worn for about a week, after which a temporary corrective glass is made up in Crookes' A and worn until the refractive changes from healing have ceased; a period covering from two to six months. After this the permanent glasses are ordered.

In the case of "tumblers" the method differs only in the direction in which pressure is applied. Instead of using the flat of the hook the point is applied just above the lower limbus and the pressure directed backwards, at the same time pulling downwards toward the feet. This ruptures the suspensory ligament below and causes the lens to turn a somersault into the wound, then it is followed up with the hook and teased out like the hard cataracts. "Tumblers" or Morgagnian cataracts constitute from 10% to 15% of all senile cataracts, but by the capsulotomy method of operating they are not often recognized, and are thus reported as occurring with less frequency than is actually the case.

DISCUSSION.

Ophthalmologists are practically unanimous in the opinion that the removal of the cataractous lens within its capsule would be

surgically ideal if it were possible to effect it with a fair degree of safety.

No matter, on the one hand, how perfect an operation may be theoretically, or, on the other, what theoretical objections may be raised against it, it is only the test of time, based upon the results in a fairly large number of cases, that can weigh the merits of such an operation. One must also take into consideration the first gush of enthusiasm that is so apt to accompany any procedure, carried out in a distant land under strange surroundings, and especially when under the hand and guidance of such a master as Colonel Smith.

What are the results of the Smith-Indian operation when performed without Smith's supervision and upon Americans instead of Hindus?

The main arguments against it are the technical difficulties and the danger from loss of vitreous. The argument based on its difficulty is no more valid than would be a similar argument against the performance of a labyrinthine operation, or one for the removal of a hypophyseal tumor, because they also require a highly developed technique; not all men have the training nor are they naturally adapted for such difficult operations.

As to the loss of vitreous, this depends to a large extent upon the degree of skill of the operator and the manner of controlling the lids by the assistant. While it is not desirable, still loss of vitreous is not so great a calamity as it is imagined by many, provided that the amount lost is not too great and that the toilet of the eye is properly completed when such loss has occurred. Furthermore the frequency of vitreous loss in skillful hands should not be much greater than by the capsulotomy method. Personally we consider it much more harmful to leave capsule or lens matter behind than to experience the loss of a small amount of vitreous.

The principal arguments in its favor are that no waiting is necessary for the cataract to become ripe, as an incipient or immature cataract lends itself to the operation as well as the mature. This lessens delay and disablement,—business, social, physical, and mental. Again, one operation only is needed to restore vision; no preliminary operation being necessary, nor needling for secondary cataract. Further, the patient obtains useful vision in from two to six weeks; and this does not deteriorate as time goes on which is so frequently the case after the capsulotomy operation, being due to inflammatory conditions or to secondary cataract formation.

It is now over two years since we first commenced to do the Smith-Indian operation in this country, and during this time we have performed by this method about one hundred and fifty operations upon Americans for senile cataract. We feel that the time has been long enough for us to form an opinion of the merits or demerits of the operation, and in a future paper we shall give an analysis, with tabulated results, of the senile cataract operations performed by us during this period, with a statement of the visual results obtained as taken from our case records. These records cover periods of observation varying from one month to two and one-half years.

If our results from the intra-capsular operation were inferior to those obtained with the capsulotomy method then in justice to our patients and to ourselves we would have to abandon it; in fact, we should soon be abandoned by our patients, for nothing spreads more rapidly than a failure with a cataract operation. However our results with the Smith-Indian operation in the past two years have been increasingly satisfactory, the eyes remaining free from inflammation and without the deterioration in vision, so frequent in the old operation. We should consider it a long step backward were we again compelled to resume the capsulotomy method with its entailed waiting for the cataract to ripen and with the dangers from subsequent inflammations and needlings.

TREATMENT OF CATARACT AT THE CENTRAL BRANCH OF THE NATIONAL MILITARY HOME.

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DAYTON, OHIO.

Read before the American Academy of Ophthalmology and Oto-Laryngology at Memphis, Tenn., December 13, 1916.

The patients we have to deal with at the National Military Home are not like those met with in private practice. They are men, the ages of whom are between seventy and eighty-five years. Men, who most frequently, have no home ties or close relationships. Men, who, as a rule, have lived lives of hardship and exposure. Many have been none too careful of the kind of life they have lived; some are actual derelicts, many are cripples, most are in disease, few indeed could be considered healthy.

Perhaps the most frequent and troublesome condition to be met with in the after care of these patients is some genito-urinary trouble, nephritis, cystitis, or acute retention of urine. Together with their advanced age and general physical condition, their mental condition is not of the best and post-operative insanity is quite frequently to be taken into account. Chronic nasal catarrh and so-called senile conjunctivitis are common and must be taken care of.

It must be remembered that these men are the remnant of that great body of men who fifty-two to fifty-five years ago took part in our great internecine struggle and were exposed to all the ills—mental, physical, and moral—which such a life must of necessity entail.

Our first care always is to get the patient into as good condition as we can. As might be expected, some will brace up after a few days of rest and treatment, but a goodly number does not. The patient is taken into the hospital several days before the operation is scheduled. The intestinal tract is carefully cleansed, the urine is examined one, two, or more times as conditions indicate. Usually a complete history of the patient as to genito-urinary trouble, or heart trouble, or, in fact, any chronic functional difficulty, comes with him to the eye wards. The blood pressure is always taken and if abnormally high an attempt is made to lower it. However, high blood pressure is not a grave contraindication to an operation. I have operated several times when the sphygmomanometer registered between two hundred and two hundred and thirty-five millimeters of mercury, with no evil results; the

only difference noticed was a slightly longer time required for healing.

A very annoying condition and quite a common one amongst these old men is a sub-acute catarrhal conjunctivitis. Examination of the secretions from these eyes very seldom shows any virulent organism present, just such as are found in the secretions from most old peoples' eyes, and yet there is a discharge which gathers at the roots of the cilia and at the inner canthi and which will soil the test bandage. A zinc sulphate astringent or a one per centum solution of silver nitrate has been most efficacious in treating these cases.

Commonly associated with this is a chronic rhinitis, which is treated by an alkaline spray and menthol vapor.

Every organ of the man is looked after carefully and the general condition raised to as high a degree of efficiency as possible before operating.

An intracapsular operation has been performed with very few exceptions. A brief description of this procedure will probably be in place at this time.

The instruments used are those used and advocated by Colonel Smith of Amritsar, India. The site of the operation is prepared after the usual manner and the patient is then brought to the operating room in his bed. At the Home all operations on the eye are performed in the bed, which is equipped with large castors. This equipment was furnished at the request and under the direction of the late Dr. D. W. Greene. The bandage being removed, the eye is anaesthetized by instilling a drop or two of a four per centum solution of cocaine four times within about ten minutes. The conjunctival sac is then thoroughly flushed after the manner advocated by Colonel Smith. The special speculum being introduced, it is possible to lift the lids away from the globe so as to freely expose the entire conjunctival sac, which is flushed with a warm, sterile, normal salt solution. Dr. Greene used a one to three thousand bichloride solution for a time but abandoned it because it appeared to excite an undue conjunctival inflammation. I have continued the use of the normal salt solution.

It is our custom to leave the speculum in during the incision and the iridectomy. The incision is made wholly corneal, including fully half the circumference; the puncture and counter-puncture entering and emerging respectively a millimeter or more external to the corneo-scleral ring. If the tension is low or there is indication of a fluid vitreous, the incision is brought out high on

the cornea; otherwise near the corneo-scleral margin. When this high incision is made it seems a trifle more difficult to deliver the lens, but it very much lessens the danger of loss of vitreous.

An iridectomy is always made (I have not tried to do an intracapsular operation without making an iridectomy), sometimes expressing the iris with the forceps without entering the wound and again after the usual method. I have failed to see any difference in the results. The speculum is then removed and the assistant holds the upper lid with the special hook in his right hand, and controls the lower lid with his left thumb or first finger. The operator stands at the top of the patient's head, his left arm under the right arm of the assistant. In his left hand he holds the double-ended spud, the small end of which he has always ready for use in case the vitreous presents or the lens refuses to start. In his right hand he has the delivery hook, the ball of which is placed on the cornea, a millimeter or so below a point immediately over the center of the lens; the arm of the hook is laid flat on the cornea.

The delivery of the lens is quite impossible to describe accurately; one must not only see it done, but do it in order to appreciate it, and yet in a general way it is as follows: Having placed the hook as above described, a *quick*, gentle pressure is made directly backwards toward the posterior pole of the globe. This should loosen the zonula sufficiently so that by continuous pressure the lens will present in the corneal wound. The direction of the pressure from this point on should follow the lens in such a manner as to facilitate its emergence. If the lens has been more freely loosened at the lower edge by the first sharp pressure, it may not immediately present in the corneal wound, in which case the ball of the hook should be moved lower on the cornea and the lens will then turn over and the lower edge emerge first through the wound—the so-called tumbler. If the lens does present but seems to stick in the wound, I do not hesitate to tease it by changing the position of the hook on the cornea and by changing the direction of the pressure.

The lens delivered, the pillars of the iris are replaced and the edges of the wound coapted as perfectly as possible. The lids are closed and covered with sterile vaseline. A light cotton pad is placed over both eyes and fixed with adhesive strips, over this on the operated eye is placed an aluminum shield. A cotton pad is placed across both eyes and held on with a bandage. The patient is then kept quiet on his back until the next morning.

I have not thought it wise to discuss any of the complications

which may occur during the operation, as that would make the paper too long, besides, the one reason for presenting this paper is to get your experience with and opinions of the open treatment after cataract operations.

Having observed for a number of years the frequency of post-operative mental disturbances and the many even serious kidney and bladder troubles, we determined to try out a less severe regime of bandaging and much less restraint of activity of the body, and have since continued this plan, lessening the tension whenever we felt it would be an advantage. It is our custom to operate about one o'clock in the afternoon. As stated above, the patient is kept quiet as possible until the next morning when the bandage is removed and the eye examined. There being no unusual appearance, a very light pad is put over the operated eye. The patient is allowed to turn to the side opposite the operated eye, or if he complains of his back hurting we place a back rest in the bed for him and he sits up. The use of atropine is not routine. Drugs are used only as indicated. At night the nurse places an aluminum shield over the pad on the operated eye for protection, particularly from the patients fingers while he sleeps. On the second morning the dressing is removed and, there being no contraindication, is not replaced. From this time on he has the freedom of both eyes, except at night when the light pad and aluminum shield are used for protection as long as may be thought best. The patient is allowed to sit in a chair on the second day. About the only restraint from this on is that we keep the patient in a darkened room for five days or more.

Under the conscientious and efficient care of Dr. John E. Kelly, the resident assistant, who has worked persistently and enthusiastically with me during the past three years, and more than a year before that with Dr. Greene, and the exquisitely trained nursing of Miss Anna D. Wescott, who has served in these eye wards more than thirteen years, this method has proven so much better for all concerned, that we are convinced that with the conditions under which we must work, it by far excels the closed treatment. And why not? Bandage both your eyes, lie on your back for twenty-four to forty-eight hours without moving, and, though you do not have the worry incident to an operation, I am certain you will have to admit the very great nervous strain it entails.

The lids form the most perfect bandage and protection to the eye and it is only necessary to keep the operated eye closed until the first intention of healing has progressed far enough to allow

the movement of the edge of the lid over the wound without injury to it. This most frequently occurs after eighteen to twenty hours.

That the danger of infection is lessened is equally true, we believe. Given germs and a proper soil, then darkness and absence of air, together with heat and moisture, are unquestionably the most favorable conditions for reproduction. The converse is obviously true. With the bandage we add darkness, exclude air and retain heat and moisture and thereby make a most efficient incubator. The absence of a bandage facilitates the examination and treatment of the eye should that become necessary.

The natural conformity of the lids to the shape of the eye-ball moulds the coapted edges of the wound into the normal curvature of the cornea and this, I believe, tends to obviate cicatricial astigmatism, while a bandage would probably increase it.

In closing let me say: I have indicated the class of patients, the pre-operative care, and the manner of operating, for the sole purpose of bringing to your notice an open method of post-operative treatment. This method is based on my experience in a few over two hundred cataract operations, performed at the National Military Home, in St. Elizabeth Hospital and in my private practice and which covers a period of a little more than three years.

THE "OLD" AND "NEW" CATARACT OPERATION

(Continued)

MAJOR M. CORRY AND RAI PUNDIT HARI SHANKER BAHADUR
DELHI, INDIA.

In the May number of the *Ophthalmoscope*, Harold B. Grimsdale, commenting upon Colonel Smith's article on conjunctival flap operations says, "Colonel H. Smith brings several allegations against conjunctival flaps."

A good many of these points are difficult of discussion, but the first and second relate to matters of fact which should be verifiable without much difficulty.

As to the first objection, namely, that the time spent on the operation is quadrupled, I have for some years made a practice of cutting a conjunctival flap in all cataract operations from within outwards without any ballooning of the conjunctiva by subconjunctival injection.

I find this makes no appreciable difference in time; nor do I find that the flap interferes seriously with the after manipulations. The whole operation from start to finish, I find, takes me 6 or 7 minutes, including the application of the bandage.

As to the second objection raised by Colonel Smith, namely, that the amount of astigmatism in the case of conjunctival flaps is often very marked, that has not been my experience. I have looked up the last 20 cases without selection, and have found that in one case there was chosen a cylinder of 4.0 D., in one 3.0 D., in one 2.50 D., in six 2.0 D., in one 1.5 D., in four 1.0 D., in five no cylinder and in one —1.0 D. cyl. horiz.

The average cylindrical correction, therefore, is about 1.25 cyl. D. axis horizontal.

In one case the lens was extracted intracapsularly by the vectis, because it was tremulous; but the operation was not made more difficult by the presence of the flap.

On the other hand, I am convinced that the average stay in hospital is less since I adopted the routine use of the conjunctival flap, although I am unable to attribute this entirely to the flap, as at the same time, or thereabout, I made two other modifications in technique which have no doubt played a part."

We have already said that the time taken to perform the flap operation as practiced in Delhi is between one and one-half to three minutes, not including the time taken to apply the bandage.

Colonel Herbert, commenting on the same article says, "Unfortu-

nately, the only conjunctival flap, cut with the knife during the making of the corneal section, apparently tested by Colonel Smith, is much more extensive and longer than that in common use. It consequently led at times to excessive astigmatism, due to the deep wound opening up under the conjunctiva from pressure of aqueous as soon as the conjunctival flap became adherent. Also in this way evidently a filtering cicatrix was found to develop, as has been described by the reviewer. But the distinction has not been drawn by Colonel Smith between this truly filtering cicatrix and the "cystoid" scar responsible for late infections. Late infection has not been found associated with the cicatrices resulting from these long gaping cataract wounds, apart from incarceration of iris, etc. Owing to the omission of the ordinary limited conjunctival flap from Colonel Smith's experience, the conclusions, summing up entirely adversely to conjunctival flaps in general, are rendered useless and more or less untrue. Trouble with hemorrhage into the anterior chamber at the time of operation and afterwards, appears to show that adrenalin solution was not instilled before hand at the proper time."

We are in favor of a large conjunctival flap. A filtering cicatrix may form in a few cases, this will slowly close up, the union will commence at the corners of the wound, the high astigmatism will thus be only temporary. If, however, the long time during which this will be completed is objected to, a snip may be made in the ballooned conjunctiva, a small piece removed, and aqueous let out. The dressings may be kept on for a few days longer. Why should all cases be deprived of the advantages of a long flap for the sake of a few who can very easily be separately dealt with. Opinions seem to vary a great deal as regards post operative astigmatism.

Fisher of Chicago showed ten patients on whom twelve operations were performed, before the Chicago Ophthalmological Society in November, 1914. Half of them were cases of juvenile cataract. He pointed out that the pupils were not drawn up, and that astigmatism had been produced in only one eye out of the twelve. The average vision of the series was 20/24. Smith's intracapsular extraction was performed in these cases.

This seems to be a much better result than that found after couching where no incision is made.

We have examined many cases where couching was done and retinoscopy showed that they had a certain amount of astigmatism sometimes amounting to two degrees. Post operative astigmatism

is not wholly the result of incision, part of it is indispensable and is found even in cases where couching has been performed.

The condition of the interior of the eye ball markedly changes with the disappearance of the lens diaphragm. The contraction of the external muscles of the eye ball can now alter its shape and the curvature of the cornea becomes the section of an ellipse not that of a circle. This seems to be the result of the stronger action of the muscles which act on the horizontal meridian compared with those which act on other meridians. The diaphragm of the lens and suspensory ligament keeps the corneal curvature constant in normal eyes. The results obtained by Dr. Fisher are astonishing. We should like to know the means adopted by him in determining post operative astigmatism in the eyes of the twelve cases referred to. It is not correct to state that because a patient's vision becomes 6/6 with a spherical lens he has no astigmatism. If retinoscopy be done on these cases and proper compound glasses be put before the eyes their vision sometimes will come up to 6/3 or 6/4, the letters on the test types will appear clearer and the patient will feel more comfortable.

Paul Petit of Rouen finds that post operative astigmatism is slight in his cases of cataract extraction where the corneal incision is made at the level of the limbus with a small free conjunctival flap. He also says, "The flap unites rapidly, gives good protection against infection, and tends to prevent capsular incarceration, which is facilitated by the iridectomy." According to Colonel Smith's, Captain McKechnie's and Thomson Henderson's views and those of others who agree with them, the astigmatism ought to be high in limbal incisions.

We have given results obtained by retinoscopy on our cases in a separate article under the heading of "Eye Strain" and feel sure that in numerous cases astigmatism is slight in the flap operation as practiced in Delhi.

A very large number of results obtained by different surgeons require to be collected in order to know the amount of astigmatism usually found after different operations.

Part of it we have shown is indispensable and ought to be expected practically in every case, the amount varying with different persons according to the relative and absolute strength of the external muscles and the degree of softening produced in the eyes by operation. The astigmatism due to softening of the eye disappears when the eye has regained its tension.

When the diaphragm of the lens is gone the vitreous enclosed

in the hyaloid membrane occupies the space vacated by the lens and presents a convex surface in the pupillary region. This convexity can be increased by the compression of the eye ball between the external muscles and this would increase the refraction also if the refractive index of vitreous were higher than aqueous instead of being equal. While the vitreous is thus moulding from external pressure the points of attachment of the various external muscles are being pulled on by their contraction, the sclerotic is being pressed upon changing its shape, the pressure is also being transmitted to the cornea altering its curvature. Perhaps also a little lengthening of the eye ball in the antero-posterior axis occurs. Convergence will increase the pressure on the eye ball from external muscles and will still further alter the curvature of the cornea. This seems to account for a certain amount of accommodation sometimes found in cases of aphakia, the work of the ciliary muscle being taken up by the external muscles of the eye ball in the absence of diaphragm of the lens and suspensory ligament. Convergence thus causes accommodation and a slight increase in the astigmatism at the same time. This seems to explain the fact that sometimes patients prefer to have a weaker cylinder for distant vision than the one that has been determined for them by retinoscopy because at the time of retinoscopy the eyes are converging to a distance of one meter or even two meters, if the retinoscopy be done at that distance. It should be clearly understood that the space vacated by the lens in cataract operations is occupied by the vitreous to a large extent and not by the aqueous as stated by many, especially when the lens is removed entire.

Treacher Collins describes the case of apparent accommodation with aphakia at the Annual Congress of the Ophthalmological Society of the United Kingdom, 1915. He said the boy who had lamellar cataract removed from his eyes by repeated discision operations at the age of seven was found able to accommodate when he was fourteen. He was using only one pair of glasses for both distance and reading. In this case any alteration in curvature of the cornea while he adapted his eye for the near point was excluded by examination with the ophthalmometer and by the use of Batten's eye bath. Any lengthening of the antero-posterior axis of the globe was watched for by ophthalmoscopic examination. He thought that in the case of the boy referred to there was not any true accommodation and that the boy's power of seeing clearly at different distances was due to the cutting off of circles of diffusion, partly by the contraction of the pupils, but mainly by the small

central openings in the membrane. He quoted several other cases which have been recorded in which apparent accommodation was present after the removal of the lens. We have found that some cases in which lens has been extracted entire with an iridectomy can also accommodate. The accommodation in these cases cannot be the result of a pinhole pupil, because it is sometimes present even when the lids are not allowed to make the pupil narrow.

The convergence accommodation referred to by us is generally found in young healthy subjects with strong external muscles and in prominent eye balls because in these the external muscles can exercise more pressure. These are cases of accommodation caused by the voluntary muscles and these cases of refractive error also suffer from eye strain. The definition of eye strain therefore given by Ernest Clarke and referred to by us in our article on eye strain appears to be incomplete.

NEW OPERATION FOR ECTROPION.

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AND

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(Illustrated)

Ectropion is the revolution of the eyelid outward so that the conjunctiva surface looks forward. If the *ectropion* advances, eversion of the Puncta is brought about and epiphora development causes an increase of the ectropion by the contraction of the skin of the lower lid. Ectropion can be present in all degrees up to complete eversion of the entire lid; we name the most common forms:

(1) *Ectropion*. Due to chronic conjunctivitis and exposure to the air.

(2) *Ectropion*. Blepharitis and Ozoena, etc. A vicious circle is established and epiphora is increased with the resultant tears flowing over the cheeks.

(3) *Beefsteak Ectropion*. (Daniel W. White and Peter Cope White). This ectropion is the most marked of any of the forms.

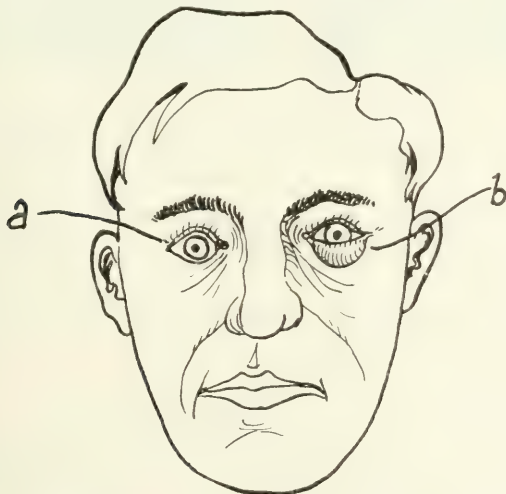


Fig. 1—*a*—normal eyelid; *b*—complete and entire ectropion of lower lid. Eyelashes are not visible, due to eversion of lid.

Note—A very marked ectropion due to trachoma, D. W.; age 26 yrs; white; duration of disease 15 years.

It is found in the Beefsteak Cicatricial, slow advancing cases of trachoma. The entire lid is completely everted (see diagram) and it gives the appearance of an almost wholly raw surface extending from the eyes to the mouth. It is found in obese patients past middle life. (See Daniel W. White's U. S. Government Eye reports on 52 cases of Ectropion.) (See Picture of Case D. W. before operation.)

BEFORE OPERATION



AFTER OPERATION



D. W. (Age 22 years)

Advanced case of trachoma; ectropion lid with complete eversion; ptosis of upper lid.

After operation for ectropion by Daniel W. White and Peter Cope White; new operation White Bros. Hospital.

(4) *Spastic Ectropion*. Due to Spasticity of the Palpebral muscle from Blepharitis, etc.

(5) *Ectropion Paralytica*. Paralysis of Orbicularis Palpebrarum muscle.

(6) *Ectropion Senilis*. Due to laxation of parts in advanced life augmented by senile chronic catarrhal conjunctivitis.

(7) *Ectropion Cicatricum*. Due to burns, ulcers, gangrene and bone encolvement, lachrymal, etc.

(8) *Ectropion Trachomatous*. Due to the pathologic process of trachoma. Gonorrhoea also produces ectropion of the lower eye-lid in the chronic cases.

The Pathology of Ectropion.

Unless you understand the pathology of ectropion you will perform many an ectropion operation with almost complete failure. At the time the operation is finished you pronounce it an ideal result but the result three months later is anything else but what you desired. The conjunctiva in ectropion is thickened and has

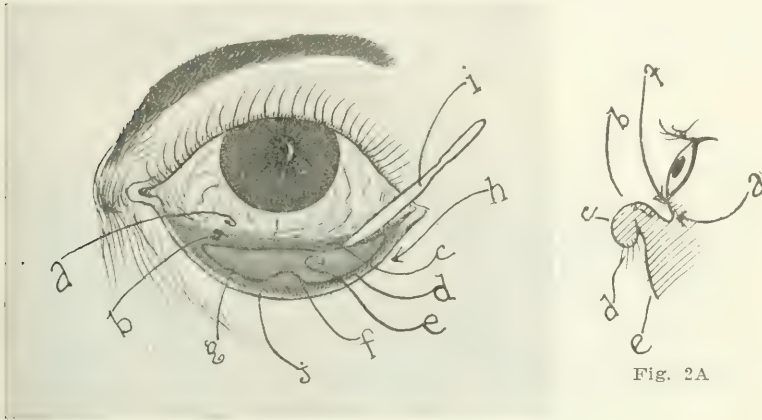


Fig. 2

Fig. 2—*a*—Ocular conjunctiva; *b*—junction of ocular and palpebral conjunctiva; *c*—strip of conjunctiva of lid and cartilage beneath conjunctiva left after removal of boatoid cartilage and conjunctiva; *d*—strip of cartilage and conjunctiva near peripheral margin of lid remaining after the removal of palpebral conjunctiva and tarsal cartilage; *e*—boatoid space after excision of palpabla conjunctiva and tarsus; *f*—lower end of incision and showing center elevated curve; *g*—upper line of incision; *h*—eyelashes beneath—eversion—not visible; *i*—scappel, making an incision slanting downward and inward in order to leave overhanging and coapting edge, for lower flap; *j*—cicatricial (white) line.

Fig. 2A—Section view of ectropion; *a*—junction of ocular and palpebral conjunctiva, showing sulsus; *b*—highest point on the everted eyelid; *c*—gradual decline of high point on lid; *d*—eyelashes; *e*—face; *f*—ocular conjunctiva.

undergone great proliferation and crowds the lid away from the eyeball; the contraction of the muscular fibres of the orbicularis then suffices to complete the eversion of the lid. The distortion of the lid is produced by the cicatricial contractions of the conjunctiva and tarsus of the thickened tissue. "This tissue very often resembles beefsteak (White)." This distortion is seen readily if the lid is inverted or the patient looks upward. (D. W. White and P. C. White.) The tissue of the lid and face becomes nephriticoid, that is, lax and boggy (Tylosis) due to the weight of the outward

diseased lid and the contractions of the orbicularis. In the *cicatricial* form of ectropion you will find the subtarsalis line of contraction, or a whitish line, running along a few mm. above the free edge of the lid and parallel with it on the conjunctival surface. This line produces a furrow and gives the lid a bowl-like or boatoid shape. The conjunctiva is contracted by pulling the tarsus downward and causing bulging. The infiltration of the tarsus is greater near its lower margin along the line at which the blood vessels pass to the conjunctiva from in front to perforate the tarsus. This infiltration which is carried from the conjunctival vessels to the

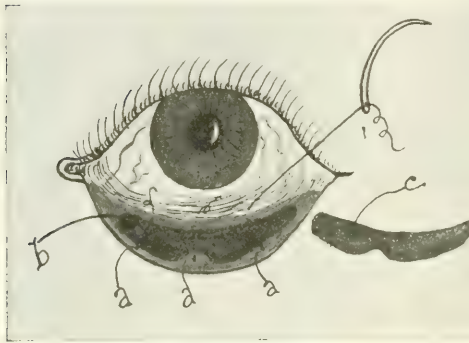


Fig. 3

Fig. 3—*a*—suturing (sutures) the lower palpebral conjunctival and tarsal edge to the upper palpebral conjunctival and tarsal edge, thus causing slight inversion and covering the boatoid space; *b*—boatoid deep space, after removal of tarsus and palpebral conjunctiva; *c*—shape of excised tissue.



Fig. 3A

Fig. 3A—Sectional view of ectropic eyelid after removal of boatoid section. *a*—sulsus; *b*—boatoid space.

tarsus, finally passing into the cicatricial stage, which makes the whole tarsus thinner and narrower and greatest at this point and produces an angular bending of the tarsus thus producing a cicatricial line that is seen running horizontally on the conjunctiva tarsi.

The Normal Tarsus and Conjunctiva present:

- (a) Subtarsalis sulcus.
- (b) Meibomian glands.
- (c) Eye lashes.
- (d) Ocular conjunctiva.
- (e) Fornix.
- (f) Palpebral conjunctiva.
- (g) Cornea.

The posterior border is sharp. The upper convex border looks downward and is stretched into a straight line. The lower border has an arched course.

Pathologic changes in eyelid present:

- (a) Cicatrical line.
- (b) Cicatrical bands.
- (c) Tough eyelid.
Eversion of eyelid.
- (d) Retrotarsal fold shortened.
- (e) Cylindroid cartilage.

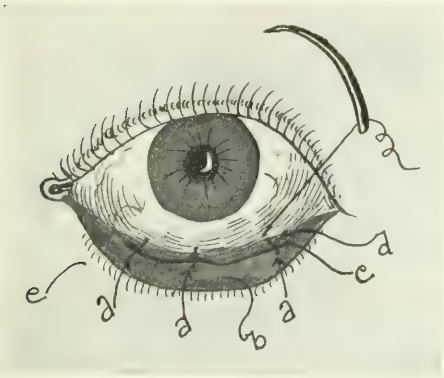


Fig. 4

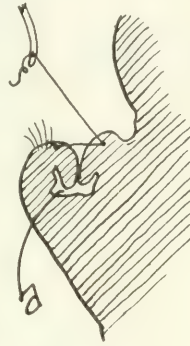


Fig. 4A

Fig. 4—*a*—sutures drawn and in situ; *b*—lower strip of palpable strip and tarsus; *c*—showing incision at angle for co-aptation and preparing for the final sutures to make inversion complete when the mattress sutures are in the conjunctiva and tarsus; *d*—upper strip of tarsus and palpable conjunctiva remaining; *e*—appearance of eyelashes due to slight inversion by (*a*) sutures.

Fig. 4A—Sectional view of Fig. 4, showing co-aptation of flaps and false space beneath flaps and eyelashes.

The lid is lower and shorter horizontally. The posterior edge an obtuse angle not sharp as in the normal eyelid. The retrotarsal fold is drawn on the tarsus giving laxity causing ectropion. The bulge on the convex border is easily seen. We find the tarsus is thickened by infiltration of lymphocytes, later on it shrinks to a tough connective tissue containing few inert vessels. Sometimes the connective tissue is converted into fatty tissue. (This fatty tissue has rarely been present in the *author's* examinations. U. S. Government Reports of Daniel W. White.) The tarsus conjunc-

tiva is shrunk and the fornix is drawn up in part on the tarsus. The tarsus formation into cicatricial tissue is as follows:

1. The cells in the conjunctiva disappear by absorption.
2. Another portion of the cells rupture and empty externally.
3. And still another portion forms spindle shaped cells and are finally converted into connective tissue. This tissue shrinks and the conjunctiva contracts and becomes thinner. We have the same process in cirrhosis of the liver due to the inflammatory infiltration.

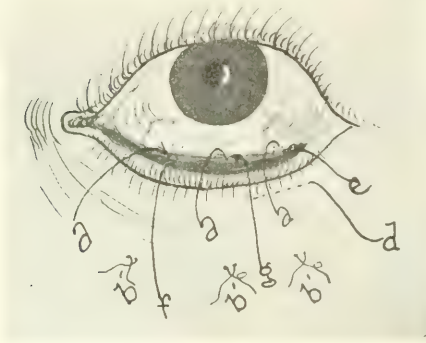


Fig. 5

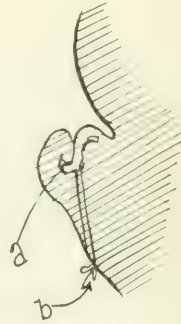


Fig. 5A

Fig. 5—*a*—Mattress sutures in situ. The sutures pull both upper and lower edges of the cartilage and palpable conjunctiva (which already have been co-apted (Fig. 4) by sutures into the deep boatoid space, beneath the false cover, and then the sutures emerge on the cheek and traction is made on the sutures and sutures tied. This causes complete inversion of the ectropic lid; *b*—sutures tied on cheek; *d*—eyelashes; *e*—upper remaining part of palpable conjunctiva and tarsus; *f*—lower remaining part of palpable conjunctiva and tarsus; *g*—slight depression or new formed sulcus of eyelid, thus creating a new trough for eyelid for tears.

Fig. 5A—Sectional view of Fig. 5. *a*—cartilage and conjunctiva pulled into boatoid deep space; *b*—suture tied on cheek.

This operation for ectropion we have performed on eighty-six cases ranging in time from three months to six years. It has been the experience of one of the authors (Daniel W. White), as no doubt has been the experience of many of our colleagues where the ectropion has been marked and if especially due to trachoma, the operations of choice have been almost complete failures and many cases would return for another operation for the same condition. The author operated on one case four times for ectropion during two years duration. For this reason the authors have given such space to the pathology of ectropion. This article deals with the advanced cases of ectropion or the entire ectropic lid where cica-

tricial tissue is the chief cause. We are of the same belief as we are of trachoma in the advanced stage, if the pathologic tissue is not removed in part or in whole in ectropion, the ectropic lid progresses until complete cicatricization. Palliative measures or the operations of choice for ectropion will not correct the ectropion, as it is plain in the V-shaped removal of skin (Wharton Jones Operation) from the lower external surface of the eyelid and cheek, and then the closing of this raw space with sutures, thus causing inversion of the lid, does not attack the pathologic tissue affected; namely, the conjunctiva and tarsus of the eyelid. This operation reminds me very often of the traveling surgeon who infests Egypt and who wins favor at once with the natives

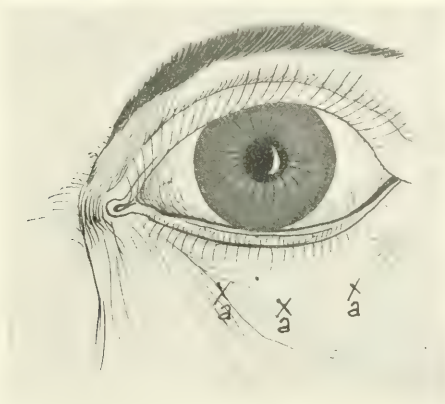


Fig. 6—Operation completed. (a) tied sutures on cheek.

after the operation is completed and then is held in refute six months later—when the ectropic condition returns. The Snellen suture operation has much more lasting effect than the V-shaped operation if performed well.

Kuhnis Operation had been a big step forward in which he removed a small triangular shaped piece in the center of the lid and the lid margin. Then Dieffenbach, to make up the deficiency, proposed the removal of a triangular shaped piece of skin adjoining the outer canthus and then uniting the edges of the wound thus producing traction on the lid. This modification of course was only a temporary measure, as the pathologic tissue still remained. The Adam operation for ectropion was also a step farther than Dieffenbach, in which he removed a triangular shaped piece of cartilage and conjunctiva at the outer canthus of the lid. I have often

stated (Daniel W. White) in treating advanced cases of trachoma, measures such as expression, grattage and astringent and other drugs will not cure the trachoma no more than removing the capsule or drug treatment for cirrhosis of the liver. Cirrhosis of the liver, if I remember, is produced by an inflammatory infiltration. The operation for advanced cases of ectropion in which we instituted and performed for many years with success is as follows:

The eyelid is stretched and if possible the junction of the ocular and palpebral conjunctiva is found and an incision, the entire length (parallel) of the lid is made, that is from the inner to the outer canthus. This incision is carried through the conjunctiva and tarsus. Another incision is made from the outer to the inner canthus at the margin of the lid through the conjunctiva and the tarsus. It is always necessary to include the cicatricial line in the incision. This boatroid shaped piece of cartilage and conjunctiva is removed, which leaves a boatroid deep space. Three sutures are (double needle sutures) introduced into the ocular conjunctiva flap or end and also into the strip of cartilage, if it is left at the discretion of the operator, equally distant from each other and the flap strip of cartilage is then pulled down into the boatroid space and the sutures are continued at the bottom of this space through the tissues and tied on the cheek. This inverts the lid and the ectropion is corrected. The palpebral end of the conjunctiva granulates in the new trough of the lid. It can be sutured, if necessary, to the other end of the ocular conjunctiva before the other sutures are introduced.

In cases where the hypertrophy of the conjunctiva is very marked we use silica rasps (sand paper) to remove it. This surgical procedure removes the drooping (Tylosis) of the lid and also aids in the correction. If the face tissues are lax or boggy, we can now use the V-shaped operation for cosmetic appearances or also use the V-shaped operation at the outer canthus which will also aid our result. We have also removed the tarsus and left the conjunctiva and used mattressed sutures in the conjunctiva in order to pull it into the boatroid depression. *In cases* due to other causes, the amount of cartilage and the amount of conjunctiva removed, the operator's experience will aid him. In very severe cases of ectropion we also remove some of the tissue beneath the cartilage and always over correct those cases; the authors wish to state an entire entropion where it is necessary to correct the entropion even after a combined excision operation, it is safer to perform an entropic operation sometimes after, not at the time of the combined

excision operation. The Streatfield-Snellen operation *with* Green's incision of the conjunctiva at the papillary margin has been the operation of entropion of choice and success in our experience. The point we desire to emphasize is not to remove the ocular conjunctiva thus causing immobility of the ball. For the inexperienced we would advise to make the incision in the palpebral conjunctiva, thus avoiding the danger line. As a matter of fact the connective tissue formation shortens the normal conjunctiva. *This operation* is applicable to all degrees of ectropion, the amount of cartilage and conjunctiva excised will be for the judgment of the operator to decide. Electricity is indicated in Spastic and Paralytic Ectropion. In the operation we perform we *remove* the cause and thus secure our permanent results.

THE INTERNAL SECRETORY SYSTEM AND THE EYE.

DR. ROBERT SCOTT LAMB, F. A. C. S.,

WASHINGTON, D. C.

It was my purpose when sending the title of this paper to our president to arrange the eye symptoms which were most often found in connection with or could be definitely associated with or caused by disorders of any certain gland among the glands of the internal secretory system in such a way as to make it possible to aid somewhat, or to a great degree, in the diagnosis of glandular over secretion or insufficiency.

It is possible that at present few symptoms could be so thoroughly identified with imbalance of any one gland as to be considered pathognomonic of either increased or decreased secretion. As a matter of fact the imbalance in any one gland is apt to bring about a reaction in another, or even several glands, so that the earliest symptom becomes combined with, or confused with other symptoms, the result of pleuriglandular secretion admixing in the blood or other tissues and causing intensified stimulation or antagonistic stimulation.

Therefore there need be no apology for any present inability to clearly define the exact effect of the introduction into the blood of any secretion from any one gland.

Nevertheless we must endeavor to associate with each known secretion any symptom or symptoms which may either be caused or modified by it. For as I have elsewhere pointed out many of the patients suffering from disorders of one or more glands of the internal secretory system usually consult the oculist for headache as much as ten years prior to the general manifestations sufficiently noticeable to call for the advice of their regular physician, and early correct diagnosis may save much mental and physical suffering and some invalidism.

It is to this task then I set myself and the statements herein contained summarize the findings resulting from this study of never ending and intensely absorbing interest.

I am sorry to be compelled to epitomize because an elaborate discussion would serve better in an attempt to understand what has been done in the embryology, anatomy and experimental physiology of the endocrine system; however, I have to take for granted a preliminary survey or previous study of this subject by every one of us.

It is of course impossible for us to consider the effects of internal secretory imbalance without frequently realizing the close association with the sympathetic proper and the vagus or autonomic system.

Some secretions stimulate one system, some the other; for instance Thyroid stimulates the sympathetic and Thymus the autonomic system.

When the sympathetic is stimulated slightly and not reinforced or antagonized abnormally, there is a transient dilation of the pupils, a slight retraction of the lids, et cetera; but when the stimulation is prolonged or reinforced such signs appear as Kocher's or Rosenbach's (Hoeman's) or Stelwag's; and when this reinforcement and stimulation can be sustained for a length of time or can be multiplied in intensity over a shorter period of time such symptoms as Gifford's, von Graefe's or even a typical picture of Graves' disease (Basedow's) may occur. Such a condition usually occurs when the adrenals are strong and the sensitization of the plates of Langley is produced by thyroid hypersecretion.

In some such cases the pupils may be smaller than would be expected, but this is because of thymus or posterior pituitary secretions introduced into the blood having an antagonistic action.

In fact an upset to the imbalance of secretions sufficient to cause such an outward physical appearance as Graves' disease is bound to be pleuriglandular oversecretion with the secretions from certain glands dominating.

When the vagotonic or autonomic system is stimulated there is an immediate tendency to contracted pupils, narrower than normal, palpebral fissures—esophoria—spasm of accommodation, congestion (deep) of ciliary body and chorioretinal and scleral vascular disturbances. The thymus and pituitary favor such conditions. The more chronic inflammations may usually arise in conjunction with vagotonia, but such a condition as simple glaucoma is probably the end result of gonadal and adrenal insufficiency. Whereas acute inflammatory glaucoma is probably the result of a sudden imperative demand upon the adrenals for secretion to sustain the body in its attempt to defend itself against shock, fear, etc., in the presence of gonadal and adrenal insufficiency; for although the secretion is forthcoming for a short period, the inability to continue to supply it causes a precipitate lowering of sympathetic tone and throws the balance under the control of the vagus. This of course in the presence of predisposing factors, such as high hyperopic eyeballs and other anatomic abnormalities.

This idea of the etiology is substantiated by the fact that pilocarpin and adrenalin by hypodermic injection overcome the attack and furthermore stimulation to the sympathetic is well known to be always beneficial.

In internal secretory imbalance there may be esophoria or exophoria depending on whether the dominating secretions are stimulating the vagus or the sympathetic.

Changes in vascularization become arterial activity or venous passivity, intra ocular as chorioretinitis, acute or chronic, or extra ocular as ciliary or conjunctival congestion, bright red or dull garnet red, depending on sympathetic or vagus stimulation. Disturbances of vision occur.

Visual acuity diminishes in either case and the difficulty of finding proper correcting lenses is markedly increased. Such patients often go the rounds for more reasons than one in as much as their headaches continue.

Binocular fixation is hard to maintain and the patient tires easily and asthenopia is progressive.

Hemianopsia may occur as in the case of hyperplasia of the anterior pituitary—a bitemporal hemianopsia—yet other disturbances of retinal circulation causing transient subjective symptoms of scotoma, as scintillating scotoma, are doubtless due to abnormal endocrine secretions.

Is it presumption to have suggested so many possible changes in our conception of the etiology of ocular symptoms?

Having studied the literature of experimental physiology relative to substances derived from the endocrine glands, as far as I have been able to obtain it, and having observed closely the therapy of these substances on normal persons and others known to be suffering from disturbed function of one or more glands of this system, I firmly believe it is not presumption. Furthermore I feel sure as you consider what I have suggested and contribute whatever information you may derive from your own observations of the influence of these secretions, normal and abnormal, upon the eye and its appendages you may transcend to even higher flights in this expanse of present day romance in medicine.

PRACTICAL VALUE AND LIMITATIONS OF THE TONOMETER*

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DENVER, COLO.

The practical value of an instrument of diagnosis rests upon two things; the data that it yields, and our understanding of what these data mean. We cannot fully understand what a test is worth without some definite ideas about the limitations of its reliability and usefulness. To find out what the tonometer cannot do, and what false conclusions are liable to be drawn from its indications, is to add to its practical value.

The tonometer of Schiötz measures the depth of an indentation of the eyeball produced by a given weight applied to the center of the cornea through a steel rod. The rod acting on the short arm of a lever moves an index over a millimeter scale. The index being about twenty-five times as long as the arm on which the rod acts, each of its divisions represents an indentation by the rod of one-twenty-fifth of a millimeter.

As the instrument is applied to the eye the rod is first to come in contact with the cornea, and produces the indentation. But when, with the whole weight resting upon it, the displacement of the rod reaches its maximum, the curved base of the instrument also comes in contact with the cornea and begins to bear part of the weight of the instrument, and also to indent or change the form of the corneal surface, without adding to the displacement of the rod. The reading is only accurate when the full weight is born by the rod, the curved base taking no appreciable part in transmitting the weight to the eyeball.

If the indentation were always of the same shape the displacement of the fluid in the eyeball would be in some way proportioned to the cube of the rod displacement. But the indentation made by the rod varies in shape with its depth, with the intraocular pressure, and with curvature, rigidity and thickness of the cornea. Figures 1 and 2 indicate two of its most common and regular variations. Low intraocular pressure, greater thickness, or greater rigidity of the cornea tends toward Fig. 1, the depression being relatively broad for a given weight. High intraocular pressure or a thin flexible cornea favors a relatively deep, narrow indentation, shown in Fig. 2. In this connection it should be remembered that the corneal center may vary 0.6 to 0.9 mm. in thickness in normal eyes.

*American Academy of Ophthalmology and Oto-Laryngology, December 13, 1916.

If the corneal plate or base of the tonometer is flatter than the cornea it comes in contact with the cornea only near its center. Its bearing surface then widens with increase of the indentation. If the surface of the base has the same curve as the cornea its whole surface is at once in contact and remains so, except as the indentation of the cornea separates the surfaces. Generally the base should not touch the cornea until the rod has been fully displaced and has acted upon the index. The reading taken represents this maximum displacement of the rod, the base being just in contact with the cornea. The contact of the base with the cornea and all the pressure made through it tends to produce an indentation that gives no indication through the index, but is attended with a relatively diminished displacement of the rod. This undesirable pressure on the globe will have least effect when distributed over the largest surface, and will be least variable when so distributed. It would therefore seem desirable to have a base that corresponded closely in curvature to that of the cornea. But in different eyes the corneal curvature varies enough to be of serious importance. The following table shows the relative frequency of different corneal curvatures among 2,000 eyes, as measured with the Javal-Schiötz ophthalmometer:

Corneal Curvatures Among 2,000 Eyes.

Radius of Curvature.	Number of Eyes.	Percentage.
Under 6.5 mm.	6	0.3
6.5 to 7. mm.	10	0.5
7. to 7.5 mm.	305	15.25
7.5 to 8. mm.	1,263	63.15
8. to 8.5 mm.	409	20.45
8.5 to 9. mm.	2	0.1
Over 9. mm.	5	0.25

The Gradle tonometer with its base plate having a radius of curvature of 7.6 mm. fits the cornea accurately enough for all practical purposes in four-fifths of all eyes. But when it comes to dealing with the individual eye, averages may be misleading. In the above series of eyes there were five that had a radius of curvature of over 9 mm. On such a cornea when the edge of the Gradle base plate (7.5 mm. in diameter) rests on the cornea the rod drops 0.04 mm. before touching the cornea. So that a perfectly rigid cornea, which should show by the instrument a reading of 0, would on account of its flatness, give a reading of 1 upon the tonometer scale; corresponding to a difference in supposed intraocular tension

of 5 to 7 mm. according to the weight used. For the most extreme case of flat cornea encountered in this series, with a radius of curvature of 11 mm., the error would be almost two divisions of the scale, supposed equivalent to 10 or 12 mm. of mercury.

On the other hand unusual convexity of the corneal surface, other things being equal, causes a greater displacement of index with the same displacement of fluid, so that the tonometer indicates a higher intraocular tension than it would on a flatter cornea. This may be of some practical importance, as in the following case:

Miss J. E., aged 31, consulted me to find out if she was beginning to have glaucoma. Her father had suffered from glaucoma secondary to a dislocation of an over-ripe cataract, and her step-mother had primary glaucoma. She had been told she was getting glaucoma, and had been given a solution of eserine, that had caused very severe pain.

The tonometer index registered 8, supposed to indicate an intraocular pressure of 32 mm. of mercury, higher than the normal limit has been placed by any one who has attempted to establish such a limit for tonometric observation. With the ophthalmometer, however, her corneas were found to have a curvature radius of only 7.1 mm. This unusual corneal curvature seemed sufficient to account for the high reading of the tonometer. She was given the opinion that she had no glaucoma, and advised to discontinue her miotic. Three years freedom from any indications of increased intraocular tension seem to have justified this view of the case.

The tendency of flatness of the cornea to indicate an indentation greater than exists, or of great corneal curvature to simulate lessened indentation, or increased intraocular pressure, can be guarded against by use of the ophthalmometer; although no definite allowance can be made for any given amount of departure of the corneal radius from the average. The ophthalmometer will also show the degree of corneal asymmetry, and the presence of irregularities of surface. In the 2,000 eyes above tabulated the difference in radius of curvature in the two principal meridians amounted in some cases to more than 2 mm. For such differences also, it is impossible to apply any correction to the tonometer readings that would be of practical value. But to know that the surface is irregular and its indentation by the tonometer somewhat anomalous, will guard against the danger of attaching undue importance to its readings.

The effects of certain faults in the application of the instrument to the cornea have been brought out in a paper by Mr. Priestley

Smith (*Ophthalmic Review*, v. 34, p. 65). He demonstrated that placing the instrument excentrically on the cornea, with axis parallel to the visual axis, has the same effect as relative flatness of the cornea. It tends to an underestimate of the intraocular pressure. On the other hand placing the tonometer rod at the center of the cornea, but inclining the axis of the instrument from the corneal axis, has the same effect as increased corneal curvature (short radius). It brings about an estimate of the intraocular pressure that is unduly high. The above are the chief sources of error that lie in the lack of adaptation, or an improper application of the instrument to the eye. The more important and less knowable sources of error lie in the structure of the eye examined.

Variations Due to the Structure of the Eye.

Differences in rigidity of the cornea make it impossible in any case to know from the reading of the tonometer the actual intraocular pressure. A very large number of comparisons with manometric observations upon the dead eye might give us fairly accurate averages. But here especially averages are likely to be misleading in the individual case. Priestley Smith's tabulated observations are extremely interesting. He measured the tension of twelve human eyes under known manometric pressure. With an actual pressure of 17.6 mm. of mercury; the readings varied from 9.1 to 5.9. That is the inferred pressure from the readings would in different eyes vary from 9 mm. to 16 mm. With 25 mm. pressure the readings varied from 5.1 to 3, and with 39.7 mm. pressure the readings varied from 1.1 to 0, inferred pressures from 35 to 43. He points out that Schiötz' observations were equally variable. Of three eyes with exactly the same intraocular pressure one would be recorded as 30 mm., another 36 mm., and a third as 43 mm.

To illustrate the effect of corneal rigidity Smith took a fresh pig's eye and tested it under a manometric pressure of 25 mm. of mercury. When perfectly fresh the reading was 3.6 (inferred pressure 22.5 mm.) When it had been in formalin solution three and one-half hours, the reading was 2 (inferred pressure 30 mm.), and after 23 hours the reading was 0.5, the inferred pressure 61 mm., although the actual intraocular pressure was exactly the same, 25 mm. at each test. These facts led Priestley Smith to urge "that when a tonometric observation is recorded it is the reading and not the supposed equivalent in millimeters of mercury that should be stated." The misleading inferences about the limits of normal intraocular pressure; and the pressure that should be

taken to indicate the presence of glaucoma have currency and influence through the practice of regarding an inference (often quite an erroneous one) as an accurately observed fact. To keep our records as Schiötz and Priestley Smith advise, will serve as a constant reminder of where ascertained fact ends and justified inference begins.

But although the tonometer has not taught us the limits of normal intraocular pressure, or the boundary of the glaucoma danger zone, it is of great value in showing changes of intraocular pressure when successive observations are made on the same eye. Given all other factors constant, the reading of the tonometer corresponds quite closely to the degree of intraocular tension. The difference between successive readings of the tonometer given by the same eye at one test should not vary one millimeter, corresponding to a supposed variation in the tension of 2 to 5 mm. With allowance for this amount of possible error, readings on successive days give with great certainty the changes in the intraocular pressure of the eye under observation.

Clinical Significance of Tonometer Readings

The most serious limitations upon the practical value of the tonometer are due to our scanty knowledge of the clinical and pathological significance of tonometer readings. When the tension of the eye-ball was judged by finger pressure the inexactness of the method could be blamed for uncertainty attending the inferences drawn from our observations. Now that we have a much more accurate means of judging the resistance of the eyeball to pressure, it must be confessed that much of the uncertainty still remains. It will be a step toward the solution of important clinical problems if we frankly admit that the significance of increased hardness of the eyeball, whether perceived by the fingers or measured by the tonometer, is still very imperfectly understood. It is generally assumed that increased hardness of the eyeball is due to increased intraocular pressure. This may be true. But Priestley Smith's experiment with the eye kept in weak formalin solution demonstrates that increased hardness may arise from changes in the sclero-corneal coat, quite apart from any change in the intraocular pressure. The hardening of tissue with formalin may be far removed from vital processes, but that pathologic changes may and do increase the rigidity of tissues is a common observation.

In the softer tissues like the lids, it is always expected that the inflammation will increase the resistance to pressure. There is

reason to suppose the same thing occurs in the sclero-corneal coat. The diminished indentation of the eyeball by the tonometer depends not merely upon increased rigidity of the cornea. Indentation is brought about by displacement of fluid in the anterior chamber. This is possible only as the escape of fluid from the eyeball or the distensibility of the corneo-scleral coat makes room for it. Increased resistance of any large part of the coat must increase the hardness of the eyeball; all other things remaining unchanged. It is probable that inflammation involving the corneo-scleral coat causes such increased rigidity of it, as to produce noticeable increase in the hardness of the eyeball without any actual increase of intraocular pressure on the part of the contents of the eyeball.

Fischer's theory of edema (Hatfield Prize Essay, *Coll. of Phys.* of Philadelphia, 1909), applied to glaucoma has been the subject of experiment by himself, Rube (*Graefes Archiv f. Ophthalmologie*, v. 86, p. 258) and McCaw (*Ophthalmic Record*, v. 24, p. 284). All agree that the excised eyeball placed in a weakly acid solution becomes extremely hard, often bursting the sclera. Fischer ascribed the hardening to increased intraocular tension; Ruben to thickening and diminished capacity of the sclero-corneal coat. He found that the coat increased in weight during the process as much as 245 per cent. Such thickening was present in McCaw's experiments; and the sclero-corneal change in the sclero-corneal coat, quite apart from the pressure of its contents, may produce increased hardening. The following experiments were made with Dr. McCaw's assistance:

Sheep's eyes were tested under known manometric pressure first when fresh, then after exposure for one day to acid solution. At the second test all showed thickening with softening of the corneo-scleral coat. In some the intraocular pressure was increased, in others diminished, but in all it was higher than it would have been in eyes kept in plain water. In this case average results were significant. These were as follows, the inferred pressure in millimeters of mercury in brackets:

Manometric pressure, 37 mm. Hg., 75 mm. Hg.

Fresh eyes, 10.7 (21 mm. Hg.), 4.4 (50 mm. Hg.).

Thickened coats, 8 (32 mm. Hg.), 4.7 (49 mm. Hg.).

The average of reading before the fresh eyes were connected with the manometer was 13.2 (inferred pressure 13 mm. Hg.). The sheep's eye has a relatively flat cornea.

For the lower intraocular pressures the tonometer reading was distinctly higher in the eyes after the corneo-scleral coat had been

thickened; while with the higher intraocular pressure the effect of thickening the corneo-scleral coat was very slight.

Gross changes in the corneo-scleral coat, whether of curvature or consistency destroy the value of tonometric readings. This has been generally recognized. It is more important to recognize that great diminution in the impressibility of the cornea may arise without evident change in this coat; and without indicating the clinical entity or syndrome, known as glaucoma. If we speak of these conditions as constituting "temporary glaucoma" we give the word glaucoma to a mere symptom, without special etiology, pathology, prognosis, or treatment.

It is the most important limitation on the practical usefulness of the tonometer, that it gives readings from which high intraocular tension and glaucoma would be inferred, when the disease glaucoma, or any special tendency to it is entirely absent.

This is generally understood with reference to rise of tension following discussion of the crystalline lens, as in the following cases:

Miss M. D., aged 20 years, whose eye normally gave a tonometric reading of 9 to 10, with Gradle's modification of the Schiötz tonometer (inferred pressure of 24 to 28 mm.), a few hours after free discission of the lens nucleus, gave a reading of 3 (inferred pressure of 57 mm.). This dropped back to the normal next day.

In the case of Miss A. H., aged 18, the tonometric readings after a needle operation, varied from 7 to 5 (37 mm. to 47 mm.) for about 4 weeks, although her normal reading was 11 (inferred pressure 20 mm.).

A similar rise of tension may follow operations for secondary cataract. A week after such an operation the tonometer registered 4 (52 mm. inferred pressure), but subsequently became and remained normal, 9 (inferred pressure 28 mm.). After discission in young people glaucoma would rarely be thought of. But, as it is known to follow operations for secondary cataract in elderly people, high tension persisting for a week might very readily lead to unnecessary and harmful treatment. The following case was still more puzzling because a dislocated lens is one of the important causes of secondary glaucoma.

Mrs. A. R. J., aged 70, had double senile cataract, and the left lens extracted 12 years before. She came with hypermature Morgagnian cataract of the right eye, the lens nucleus, about 5 mm. in diameter having fallen until its upper margin showed in the lower edge of the pupil. A week later the eye developed peri-corneal

redness, pain, and increased tension. The Gradle-Schiötz tonometer reading was 4 (inferred pressure 52 mm.). Pilocarpin contracted the pupil, but gave no relief. Homatropin was then used, and in two days the tonometric reading was changed to 7 (inferred pressure 37 mm.). She was put on atropin and two weeks later the pupil was well dilated, eye nearly free from hyperemia and comfortable, tonometer reading 8 (inferred pressure 32 mm.). Five weeks later at the time atropin was discontinued, the eye was entirely quiet, the tonometric reading 9 (inferred pressure 28 mm.), and two months later it continued in this condition.

We must recognize that hyperemia or inflammation of the uveal tract is liable to be attended by increased intraocular pressure quite apart from the disease we know as glaucoma.

Miss S. L. C., aged 51, had been subject to attacks of uveal and corneal inflammation from childhood. On the fourth day of a severe attack of uveitis her eye was found to give a tonometric reading of 5 to 6 (inferred pressure of 42 to 47 mm.). There was great pain, but with active treatment for iridocyclitis, the tension fell so that two days later the reading was 10 (inferred pressure 24 mm.) and under atropin it fell in one week to reading 14 (inferred pressure 11 mm.).

In this case only the experience of similar attacks in the same patient prevented a mistaken diagnosis and wrong treatment. Four years have elapsed without any other evidence of glaucoma. The tension of this eye is generally as when last taken with reading of 13 (inferred pressure 14 mm.).

Shortly after encountering the above case Mrs. H. E. W., aged 70, came with pericorneal hyperemia and pain in the eye. The pupil had dilated freely ($6\frac{1}{2}$ mm.) under homatropin, when it was found that the tonometric reading was 4 (inferred pressure 52 mm.). Because of the clinical evidences, and the experience with the case above mentioned, this patient was put upon atropin. Three days later the tension had diminished so that the tonometer read 6 (inferred pressure 43 mm.), three days after this the tonometer reading was 8 (inferred pressure 32 mm.); and two days later tonometer reading 10 (inferred pressure 24 mm.). This patient recovered completely from the iritis, without adhesions or exudates to impair vision. Three years have passed without recurrence of iritis or any symptom of glaucoma.

Even choroidal disease, without evidence of involvement of iris or ciliary body, may be attended with hardening of the eyeball.

Miss G. N. H., aged 23, had come to Denver for tuberculous disease of the choroid involving the region of the right macula, three years before. This had been quiet for the 18 months that she had been under observation, when she noticed extension of the scotoma; and the ophthalmoscope showed recurrence of the disease at the margin of the former patch. On the fifth day of the attack the right eye became painful with some general hyperemia, and she noticed rings of color, the diffraction spectrum, about the light. Tension with fingers was recorded as plus 1, with the Gradle-Schiötz tonometer the reading of the right eye was 2 to 3 (inferred pressure 60 mm.). Left eye 11 (inferred pressure 20 mm.). Pilocarpin was instilled in the right eye and later one-tenth per cent solution of eserine repeated within one-half hour. Next day the pupil was well contracted and the eye less painful, but the tension continued high. Six days after increased tension was first noticed the reading was 3 to 4 (inferred pressure 55 mm.).

The eserine solution was continued and ten days later tonometric reading for the right eye was 11 (inferred pressure 20 mm.). A month after this the reading went to 9 (inferred pressure 28 mm.) but quickly dropped to what seemed to be the normal reading of 11 for each eye. Under tuberculin injections and attention to general health the process in the choroid became entirely arrested, leaving her with a larger patch of atrophy in the macula and a corresponding scotoma. Four years have elapsed since the last evidence of increased tension, and the eye, except for the macular lesion, seems quite normal.

Several other cases more or less resembling these instances of uveal disease have been encountered. They have not been so long under observation, but in none of them was there any evidence of glaucoma subsequent to the cure of the uveitis.

In conclusion it should be emphasized that the tonometer of Schiötz, or the convenient modification of it by Gradle, is an instrument of great practical and scientific value.

A single test with it cannot be relied on as indicating with any certainty the intraocular pressure.

A comparative test with the two eyes, when one shows nearly the average reading for a normal eye, and the other a marked departure from it, raises a strong presumption of departure from the normal intraocular tension in the latter eye.

Repeated tests of the same eye giving differences in the tonometric reading indicate with certainty pathologic change, generally

a change in the intraocular tension, so that the instrument gives very accurate indications of the course of the case.

So far from diminishing the usefulness of the tonometer the readings obtained in uveitis indicate a larger field for its application in which it will be a very valuable assistance. It seems certain that diminished intraocular tension is not a constant or pathognomonic symptom for all forms and stages of uveitis.

THE ART OF REFRACTION.

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"Were I offered a camera, as poorly constructed from an optical standpoint as is the eye, I would be justified in refusing it," was the aphorism once expressed by an ophthalmologist, and the majority of ophthalmologists concur in this view. This necessarily leads to a brief consideration of the optical imperfections of the visual organ.

Imprimis, the laws of nature are inflexible. A ray of light continues along a straight line and in one plane until its direction is changed to some other line or some other plane by an intervening substance. This ray cannot by any known method be forced to deviate from this course and assume a curved or interrupted career. Because of this truism, substances dealing with rays of light must adjust themselves to these circumstances or prove deficient in their given function.

The first ocular substance interfering with the course of the undeviating rays of light is the cornea. Let the radius of curvature of this all but invisible segment of a sphere vary the slightest amount in its different meridia and the mathematical accuracy of the pencil of rays of light is broken. The frequency of this occurrence led to the remark above quoted. But, for the sake of argument, assume that the rays of light do not undergo any deviation from a straight line in their passage through the cornea, i. e., allow them to reach the anterior surface of the lens in their proper manner. Reasoning *a priori*, their course should be so uniform that they will continue backward until they reach their ultimate destination in a mathematically ordered precision. This is as it should be; but seldom do the vagaries of development permit of a true surfacing of the various refracting media. Minute irregularities, almost microscopic in character, interfere and there results a dispersion of the rays before the perceiving elements are reached.

Were these the only disturbances interfering with the pencil of rays on its way to its ultimate destination, the problem would be simplified. Other factors, however, intervene. Taking into consideration the indices of refraction, the radii of curvature, and the nature of the refractive substance, the laws of optics immutably indicate a plane upon which these rays must focus. This plane has a definite given distance from the anterior plane where the first diffraction begins. But extraneous influences, arising dur-

ing the development of the eye; prevent the location of the elements in this mathematical plane. As a result there is a longitudinal malformation of the eye. It is not, however, within the scope of this essay to discuss either these extraneous influences or the result and malformation.

Having shown the *inconstancy of the eye in its optical relation to the constancy of the rays of light*, it now becomes necessary to discuss the purposes of refraction. If optical physiology was strictly mathematical, it would be impossible to overcome by mechanical means the errors of development. Nature, however, has aided by a certain broad compensation. Therefore, *refraction merely serves to counter-balance what nature has been unable to compensate*. The character of these natural compensations is not fully understood, although they are under constant study and analysis. Nor is their extent completely known for it varies in each individual and never remains the same in any one individual. As a result, the degree of compensation necessary to overcome the ocular imperfections must be studied under varying conditions, and *it is the function of the ophthalmologist to endeavor to correlate the optical constants of light with the optical inconstants of the eye, taking into due consideration the physiologic compensations of nature*.

From the foregoing it can be seen that the refractionist is dealing with the three problems: one fixed and two constantly varying. Were it not for these immeasurable quantities, refraction could be called a science; but this very uncertainty elevates refraction from the plane of science to the nobility of art.

Harry Thurston Peck defined art as "a system of rules and established methods to facilitate the performance of certain actions and the familiarity with such principles and skill in applying them to an end or purpose as of a practical, useful or technical nature." With this definition in mind there can be no question that refraction is truly an Art.

Having established this postulate, it remains to inquire into the character of expression of this art. Oscar Wilde maintained that "Art is the most intense mode of Individualism that the world has known." Without delving into the history of refraction, it is justifiable to assume that our present-day methods are the result of evolution and again quoting from Oscar Wilde: "There is no evolution except toward Individualism." Every successful refractionist must be an Individualist. This is further borne out by the well-known fact that no two artists employ the identical methods to attain the same end, nor will two artists employing

identical methods attain the same end. This corroborates the quotation of Oscar Wilde. Inasmuch as refraction is an art and essentially individualistic, it is not justifiable to endeavor to force any one method upon the artists of the guild. For this is selfishness which may be defined, not as wishing to do as one desires, but rather as desiring others to do as one wishes. Art is so distinctly individualistic that selfishness must be eliminated before true progress can be attained. This is as true of refraction as of any of the other applied forms of art.

From the foregoing reasoning, it can be seen clearly that individualism in refraction is the underlying basis of success, and that the greater the adaptability of the refractionist, the more pleasing will be the result. This makes refraction an Art.

DUMB-BELL KERATITIS.

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History—The history of the cases that follow present a rare form of keratitis and as I have been unable to find a record of any cases that correspond with these they are reported in hopes that the attention of ophthalmologists may be attracted to this interesting anomaly and other like cases may not escape attention.

There came under my observation, September 1st, 1915, my third case of keratitis which I have named dumb-bell from the peculiar shape of the lesion. The second case corresponded so nearly in type to the third that a detailed description is omitted.

The first case was seen in 1912, but was not carefully studied as the patient, a young man, only visited my office a few times and then disappeared. The last case, E. G., aged 45, a stocky, healthy farmer, was first seen on the above mentioned date. Two weeks previous an irritation of the right eye occurred and this had persisted to the time of his first visit. The vision of the eye was disturbed and at this visit he could only distinguish the general outline of objects. There was also a constant annoyance and desire to keep the eye closed, "not exactly a pain," he said, but all the time a disagreeable feeling in the eye and a slight dread of light and the eye was more comfortable when light was excluded.

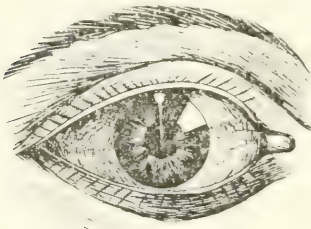


Fig. 1

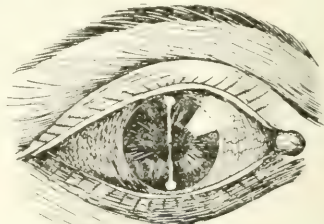


Fig. 2

Dumb-Bell Keratitis

A small greyish-white ulcer, the head of which was 2 mm. in diameter, symmetrically round, was located 2 mm. inside the sclero-corneal margin at its superior curve. From it extended a comet-like tail, excepting that the tail was markedly constricted as it left the head.

When first seen the tail extended to the center of the pupil where it came to a point, as seen in Fig. 1. This point daily extended downward until it divided the pupil into exactly two halves. When the point reached a spot at the inferior curve of the cornea at the same distance from its margin as the superior head was located, a duplicate of the superior head was formed and the ulcer had the appearance shown in Fig. 2.

When the inferior ulcer had become symmetrical in shape and equal in size to its superior companion it then ceased to advance in any direction, but apparently remained stationary for about ten days.

It was six weeks from the time the trouble was first noticed by the patient, before recovery began. The destruction of epithelium was complete over each knob of the dumb-bell down into Bowman's membrane. The connecting neck gave the appearance of invasion and desquamation of only the superficial flattened cell and the middle layer of prickle cells of the epithelium, the ulceration of the neck being superficial. No indication of the formation of vesicles was ever noticed, simply a breaking down of the epithelium. There was but slight attempt at vacularization of the lesion as is usual in superficial ulcers.

Leber states that the vascular zone of the cornea is from 1 mm. to 2 mm. wide, at the inferior and superior margin of the cornea. It is of interest to note that the limit of invasion toward the sclera corresponded to the margin of this zone, but it does not account for the perfect symmetry of the epithelial destruction.

There was but little pain and only a moderate degree of photophobia. During the ulcer's most active stage there was a slight periconal injection, but no extension of capillary vessels to the ulcer.

Nothing was discovered in the general physical condition of the patient that contributed to the cause of the keratitis. The ulcer gradually faded away, the superior and first formed head disappearing first. Recovery was complete at the end of nine weeks.

The treatment was varied and such as is usually prescribed for superficial keratitis. One treatment was tried to be abandoned for another in hopes of hastening recovery, but no treatment very decidedly changed the course of the ulcer.

Pathology—The pathologist of the University of Oklahoma, School of Medicine, attempted a culture from a smear from the ulcer with negative results. The bacteriological examination also revealed nothing specific, as has been the result recorded in other

cases of keratitis such as those reported by Fuchs in his cases of ring abscess of the cornea.

It is exceedingly strange that many superficial lesions of the cornea of widely different etiology have a tendency to extend by more or less straight lines in place of a general extension from all sides. We see this in vascular fasciculus as well as in kindred affections reported. Geometrically arranged lines occur in keratitis; (a) Striate Opacity (Streifenkeratitis, Faltentrübung), described by Schirmer, Becker, Spicer and others. (b) Filamentary Keratitis (Fädchenkeratitis) in this affection there is a distinct filament, having a knob (somewhat like the condition reported in my case) but although this is often proceeded by vesicles, nevertheless, there finally appears a distinct fibronous coagula derived from the fluids of the inflamed cornea, and the shape is due to the elasticity of the coagula, which can be removed as Hess has shown, carrying with it a portion of the epithelium; (c) trophic keratitis, fully described in a paper by Nettleship in 1897, which forms a grey stripe 3-5 mm. broad, horizontally across the cornea. But these affections are in no way to be classified with the cases I report except in geometrical symmetry.

Nomenclature and Etiology—Notwithstanding the fact that in some characteristics these cases resembled keratitis dendritica nevertheless the history and general picture made me unwilling to classify them under this affection. Kipp, who made a study of dendritic keratitis, pointed out that nine out of ten cases were distinctly attributable to malaria and were cured by the administration of quinine.

Since Kipp published his observations most writers have accepted his conclusions and ascribed the etiology of dendritic keratitis as due to malaria, in fact Ball, in his "Modern Ophthalmology," treats of the trouble under "Malarial Keratitis." But in all the three cases which I report there was no occasion to suspect malaria as an etiological factor as they came from non-malarial sections of the state and further to make sure blood examinations were made in the last two cases with negative results. My conclusion is that the form of keratitis seen in these dumb-bell cases depends upon some definite lesion in the Gasserian ganglion. (Parsons, London, has made an exhaustive study of the neurotic influence of the Gasserian ganglion upon corneal lesions.)

These cases I think are of some obscure herpetic nature although they present a negative picture in some respects to what we usually observe in herpes corneae febrilis in that there was no tendency

of the extending finger to become forked or sending out lateral branches and further there was but one primary lesion in these cases. There was also the absence of the usual amount of pain experienced in herpes.

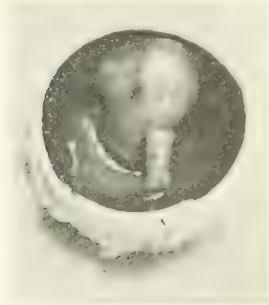
Yet the final termination of the creeping line was a nodule which is so often seen in herpes of the cornea and the superficial invasion resembled herpes as to its chronic nature.

A CLINICAL STUDY OF THREE CASES OF SARCOMA OF THE CHORIOID AND CILIARY BODY.

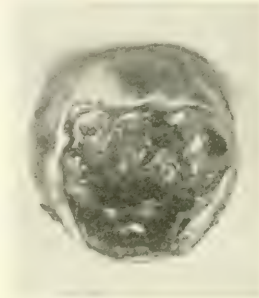
HUNTER H. MCGUIRE, M. D.,

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Writers of great experience point out the relative infrequency of intraocular growths of a malignant type. While it is definitely asserted that of all malignant neoplasms, sarcoma is the chief intraocular growth of adult life, it is likewise shown that of all pathological conditions of the eye it occurs in only from .03% to .06% of all cases. The following cases which occurred in the practice of the writer during a period of eighteen months, strikingly illustrate some of the problems which may be encountered in dealing with tumors of this type:



Case I—Anterior View



Case III—Posterior View
Sarcoma of Chorioid

Case I.—J. I. B., age 61, farmer. This patient, who was referred to the writer in July, 1914, gave a history of a gradual failure of vision in the left eye for a period of about twelve months. He had had no pain and the only subjective symptoms of which he gave an account were slowly developing blindness, and a halo around artificial lights. He had always been perfectly healthy and led an active out-of-door life. During the period of diminishing vision he failed to consult a physician and his sight was finally reduced to light perception.

Twenty-four hours preceding his visit, he developed very suddenly, almost unbearable pain in the eye, and sent for his family physician, who made a diagnosis of the iritis, prescribed atropine solution locally and administered opiates. The pain persisted and he was brought to the writer the following day.

The right eye presented deep cupping of the optic disc, no appreciable increase of tension by finger palpation and had a vision

of 20/30, which was not materially improved by lenses. While the excavation was very suggestive of simple glaucoma, the absence of any sign of atrophy, together with the normal tension, and uncontracted visual field, rather inclined the writer to the belief that the cupping was physiological.

The left eye, with no light perception, showed typical symptoms of acute inflammatory glaucoma. A dilated pupil, shallow anterior chamber, steamy cornea, and marked elevation of intraocular pressure gave unmistakable evidence of this disease. Ophthalmoscopic examination was not possible owing to the cloudiness of the media. Transillumination was not used, but would, no doubt, have yielded negative results from the fact that the growth was situated near the posterior pole of the eye, and the cornea was too steamy to have emitted the rays of light. A diagnosis of acute inflammatory glaucoma was made and eserine, pilocarpine and dionin solution ordered for twenty-four hours. The patient reported the following day, the eye showing no abatement of the symptoms. He was immediately sent to the hospital where, in the presence of a very shallow anterior chamber, an iridectomy was done under great difficulties. Complete relief of pain followed the operation, due, of course, to the temporary reduction of tension incident to opening the eyeball. In twenty-four hours, however, the wound having become sealed, the pain again became intense and continued with increasing severity despite the use of local measures for its relief. On the fourth day following the operation, hemorrhage in the anterior chamber having sufficiently absorbed to permit an inspection of the coloboma, it was found that the base of the iris had not been included in the iridectomy, and it was decided to remove another section of the iris. The second procedure, which was more easily executed than the first, resulted in an immediate reduction of tension and relief of pain as in the first operation, but again in twenty-four hours the symptoms reappeared.

The eye was enucleated the following day and a section of the globe disclosed a large pigmented tumor springing from the choroid just external to the disc. A microscopical examination showed the growth to be a spindle cell sarcoma of the choroid.

This case illustrates some of the difficulties which may arise in differentiating acute inflammatory glaucoma from the pressure symptoms due to intraocular growth. In this instance no opportunity was had to study the fundus changes during the quiescent period of the development of the growth, and the patient was not seen until the acute inflammatory phenomena incident to glaucoma

had appeared. At this time the extreme posterior situation of the tumor rendered transillumination useless, and the cloudy media made ophthalmoscopic examination impossible. The history of the case and the depreciation of vision and cupping in the right eye, while not typically suggestive of glaucoma, were, nevertheless, of sufficient moment to create in the mind of the observer the opinion that the inflammatory phenomena exhibited in the left eye were the final outcome of a chronic glaucoma rather than the glaucomatous symptoms produced by tumor.

In this case the tumor was well confined within the ocular tunics, there were no evidences of extension, and up to this time there has been no involvement of other organs.

Case II.—W. A. H., age 60, farmer. This patient, who consulted the writer in March, 1914, gave a history of a slight impairment of vision in the right eye which had been apparent for about six weeks. His family and personal history was not of sufficient importance to quote, except for the fact that he had been kicked by a horse just above the right temple some years ago. There were no evidences of fracture, and no impairment of sight at the time of the injury. He had had an ulcer of the cornea sixteen years ago which resulted in a small opacity over the pupillary area of the left eye with a visual acuity of 20/30.

With a widely dilated pupil, it was possible to make out a large detachment of the retina in the extreme temporal periphery of the right fundus. As far as could be determined at the time the detachment appeared to be a simple serous one. There were evidences of a sub-retinal effusion, but the writer could not detect through it any signs of tumor. The tension of the eye was normal and vision 20/40. Transillumination was not used at this examination, but the patient was asked to report in a few days for further observation.

For reasons of his own he failed to return until April 14th, 1914, one year after the first examination. At this time he stated that his vision had slowly declined since his first visit, and that during the previous three weeks he had experienced frequent attacks of pain, with quiet intervals, and that now he was without light perception.

An examination showed a semi-dilated pupil, shallow anterior chamber, and a tension of 58 mm. As the cornea was comparatively clear it was not difficult with oblique illumination to determine fairly accurately the outlines of an intraocular growth involving the extreme temporal side of the fundus. Transillumina-

tion of the sclera indicated obstruction of rays on the temporal side of the pupil.

The eye was enucleated the following day, and the specimen revealed a large pigmented tumor involving the temporal quadrant of the choroid and extending into the ciliary body. There were no evidences of intraocular hemorrhage, and the sclera appeared to be normal throughout. Microscopic examination proved the growth to be a melanotic sarcoma developing from the choroid.

Since operating on this patient the writer has been able to obtain from Dr. Herbert Harlan of Baltimore, whom the patient consulted during the interim between March, 1914, and April, 1915, additional records of the case. Dr. Harlan states that he first saw the patient in May, 1914, at which time the vision of the right eye was 8/200, and the ophthalmoscope showed a large shallow detachment of the retina from the fovea outward.

The patient was requested to report in two months but failed to see him again until April 9th, 1915, when all the evidences of intraocular growth were present, and immediate enucleation was advised.

This case is a striking illustration of the difficulties which may be encountered in differentiating simple detachment from that caused by tumor. While the opportunities for repeated examinations were not available, and while transillumination would, no doubt, have given positive results had the patient submitted to this test, the ophthalmoscopic picture, showing a large shallow detachment with a serous effusion, and the absence of increased tension, was more suggestive of simple detachment than of tumor. The patient died of sarcoma of the liver during the summer of 1916. Up to the time of his death, there were no signs of malignant involvement of the orbital tissues.

Case III.—T. E. B., age 48, a tailor by trade, consulted the writer in February, 1914. This patient, who gave a history of syphilitic infection many years ago, and who lost his eye as a result of a specific irido-cyclitis, gave a history of being conscious of a shadow before the left eye for a few weeks previous to his visit. At the time of the initial lesion he was given a thorough course of mercury, and since then his physician has kept him under close observation and considers him cured. For many years he has been in perfect health, and has been able to use his apparently good eye without the slightest discomfort.

An examination of the right eye showed an atrophied globe with a totally opaque cornea and complete absence of light perception.

Externally the left eye presented nothing unusual except a slight bulging of the iris on the nasal side. With the correction of a compound myopic astigmatism, the vision of his eye was 20/20, and the patient was able to read Jaeger, No. 1 with plus 1.50 sphere added.

With a dilated pupil quite a large growth of a reddish brown hue was seen springing from the nasal side of the ciliary body and almost in contact with the lens. The rest of the eye ground was normal. The tension of the eye was somewhat, though not markedly, increased. A tentative diagnosis of malignant growth of the ciliary body was made, but, inasmuch as the patient had given a specific history the possibility of syphilitic gumma was not overlooked.

Realizing the desperate plight of an individual whose only eye was, probably, the seat of a malignant degeneration, the writer advised an immediate consultation and the patient was taken to Dr. Samuel Theobald of Baltimore.

Dr. Theobald rather concurred in the diagnosis of malignant growth, but felt that it was important to exclude syphilis. A Wasserman was made with a negative result.

At the further suggestion of Dr. Theobald, and through the courtesy of Dr. C. F. Burnam, Dr. Howard Kelley's associate, it was determined to try radium. So far as the writer knows this is the first case of intraocular growth in which radium emanations have been used. It was certainly the first instance in which radium was used for this purpose at the Howard A. Kelley Hospital.

Two applications of the metal were made, the first on March 18th, 1914, and the second on April 9, of the same year. The applications made through the closed lids over the sight of the tumor for a period of thirty minutes at each sitting. As the first treatment was entirely experimental, a comparatively small quantity of the metal was tried, and there was little or no reaction following its use. For the second application a larger quantity was employed. This caused a violent inflammatory reaction in the conjunctiva of both the globe and the lids and burns in the skin surfaces of the latter. As far as could be determined there were no intraocular changes as a result of the radiation. Under appropriate treatment the external reaction slowly subsided, and the eye became quiet. Insofar as the growth was concerned, the effect of the radium was absolutely negative, and Dr. Burnam felt that its further use was contra-indicated.

The patient, who persistently declined to have the eye enucleated, was kept all the while on large doses of mercury and the iodides. His vision from this time on rapidly diminished, and the growth showed unmistakable signs of extension both laterally and back into the choroid. The lens became partially opaque from pressure of the tumor, but the opacity was never sufficiently dense to prevent a fairly satisfactory view of its outlines.

In the fall of 1914 the patient was referred to Dr. G. E. de-Schweinitz, who manifested a deep interest in the condition. After mature deliberation, Dr. de-Schweinitz felt that, inasmuch as the patient had had syphilis in his younger days, and although the Wasserman was negative, and while in all human probability, the growth was malignant, he would be inclined to give the patient the benefit of the doubt and suggested the use of salvarsan. This suggestion was carried out by the writer, and four intravenous injections were given at intervals of two weeks. The result of the treatment was negative, and after a reasonable length of time, during which period frequent examinations of the growth were made, the patient made another visit to Dr. de-Schweinitz, who was satisfied that further treatment was useless, and advised enucleation.

Notwithstanding the fact that the eye was now without light perception, its owner steadfastly refused to part with it until July, 1915. A section of the globe disclosed a large pigmented growth involving the ciliary body and choroid, which almost filled the vitreous chamber. A pathological examination proved the tumor to be a melanotic sarcoma. This patient is still in good health and up to the present time (eighteen months since the enucleation) there has been no evidence of metastatic involvement of other organs.

The writer was, very fortunately, able to watch the progress of this case at weekly intervals for a period of seventeen months. During this time two symptoms were in constant evidence, viz.: congestion of the anterior ciliary vessels over the site of the growth, and increased intraocular pressure.

The pressure symptoms were interesting from the fact that they were exceedingly variable. From the first there was increased tension, but the tonometric measurements ranged from 25 to 58 mm. The readings of the tonometer did not appear to be influenced by the gradual increase in the size of the growth. On the contrary the record showed a very high tension at one time and on other occasion the pressure was relatively low. The contention

of Fuchs that the increased intraocular pressure in these cases is not due to the size or position of the tumor, but to a transudation of fluid in the interior of the eye from choroidal congestion, appears to have been well borne out in this case.

Notwithstanding the fact that this patient had a constantly increased tension, the eye was never painful and there were never any manifestations of acute inflammatory glaucoma.

Abstracts from Recent Ophthalmic Literature

ANOMALIES

A CASE OF CONGENITAL RETRACTION MOVEMENT OF THE EYEBALL.—WITMER, J., Bern (From the eyeclinic of Prof. J. Meller in the University of Innsbruck. *Arch. f. Aug.*, 81, p. 200). A man, aged 19, always had divergent squint of his left eye, with which he could see well. Four years ago he had a febrile disease with headache and loss of consciousness. Since then the vision of his left eye was impaired and he had nystagmus. The right eye showed normal movements. The left eye can be moved only slightly upward from the medium position, and pretty far downward, without retraction. Adduction and abduction are completely missing. In looking to the right the left eye moves downward and is retracted into the orbit by 3 mm. Both eyes are then seized by nystagmic oscillations. The left lower lid at first retracts a little with the eyeball, then stops, so that a fissure is created between the lid and the globe. The upper lid scarcely participates in the movement. The left palpebral fissure is not narrower than the right.

A tenotomy of the external rectus and an advancement of the internal rectus were performed. The external rectus was converted into a tendinous, perfectly unelastic, band, and the internal rectus into an elastic formation containing muscular tissue, of which however it could not be said with certainty, whether it was contractile. The superior rectus was also impeded in its action, the inferior rectus had normal function.

That in looking to the right, only retraction, not adduction, took place is explained by the tense fixation by the external rectus at the temporal side, so that the internal rectus became a retractor. At each attempt at adduction there was a rotation downward, apparently due to a simultaneous contraction of the inferior rectus, aiding in its quality of adductor the insufficiently functioning internal rectus.

The etiology of the disease of the muscle was not known. W. calls attention to the occurrence of hemorrhages in the ocular muscles of the new-born, which might damage the muscular fibres and produce cicatricial changes of the muscle. For this supposition seems to speak a case of retraction movement due to traumatism of the ocular muscles, presented by Lauber. The chief cause for the motor disturbances seemed to be hemorrhages in the ocular muscles, with secondary changes of the muscular tissue. One must

also think of intrauterine inflammations of the ocular muscles as cause for the conversion of muscular fibres into connective tissue.

The brief review of the incident literature shows that two main points were established for explanation; insertion of the internal rectus farther back and tendinous alteration of the external rectus with normal insertion.

C. Z.

CONCERNING COLOBOMA OF THE IRIS IN ASSOCIATION WITH CONGENITAL CATARACT.—RING, G. ORAM, Philadelphia, Pa. (*The Ophthalmic Record*, March, 1917). The patient, the mother of four children, two of whom were born with ocular abnormalities, shows the following condition:

O. D. The iris below is notched or slightly folded upon itself and the pupil when dilated alters the position but slightly. At the posterior lens pole is a dense white opacity. Nuclear riders are present and numerous dots of intensive denseness suggestive of calcareous change are scattered throughout the largely opaque lens.

O. S. There is a coloboma of the iris below, with similar irregular lens opacity.

G. I. H.

BACTERIOLOGY

THE LOCALIZATION OF STREPTOCOCCI IN THE EYE.—BROWN, E. V. L., IRONS, E. E., and NADLER, W. H., Chicago (*Arch. Ophthalm.*, May, 1916, XLV, 229), report the results obtained from a study of experimental iridocyclitis in rabbits. Experiments were made with the idea of tracing the changes in the power of an organism which presumably had already given rise to iridocyclitis in a patient to produce similar lesions in animals, after varying periods of residence in the original host, of residence in animal tissues, and of growth on culture media.

Cultures of haemolytic streptococci, obtained from the tear sac of a patient, were injected intravenously into rabbits. Cultures taken during an acute inflammation produced iridocyclitis in two of four rabbits. Cultures taken subsequently, during a period of continued improvement, produced no lesions of the eye in a total of twenty-two rabbits, but produced equally severe general infections, killing the rabbits in about the same time as the cultures used in the first series. Cultures which had produced ocular lesions in the rabbits and had then been kept in the incubator for ten days no longer produced eye lesions.

The article is illustrated.

W. R. M.

THE LOCALIZATION OF STREPTOCOCCI IN THE EYES. A STUDY OF EXPERIMENTAL IRIDOCYCLITIS IN RABBITS. — IRONS, E. E., BROWN, E. V. L., and NADLER, W. H. (*From the Memorial Institute for Infectious Diseases and the Cook County Hospital, Chicago. Journal of Infectious Diseases*, Vol. 18, p. 315). These experiments were made with the idea of tracing the changes in the power of an organism (streptococcus) which has already given rise to iridocyclitis in a patient, to produce similar lesions in animals after varying periods of residence in the original host, of residence in animals tissues, and of growth on culture media. The accessibility of lesions of the eye to observation greatly facilitates studies of this sort. The exact time of the appearance of the lesions and their course can be more readily noted than when the lesions are in joints or other organs. Minor lesions which might escape notice, or disappear before the death of the animal when they involve joints or internal organs, are more easily detected in the eye.

The experiments of Forssner in which organisms after being grown in a special organ of the body, such as the kidney, acquired the power to localize and produce lesions with increasing frequency in that organ after intravenous injection, suggested the possibility of producing by successive transfers from eye to eye in rabbits a similar localization. The left eye of a patient suffering from a chronic dacryocystitis became acutely inflamed (Iridocyclitis), April 11, coincidently with an acute exacerbation of the inflammation of the tear sac. It is obvious that the streptococcus from this patient did not acquire its quality of localization through actual previous residence in the tissues of his eye, and even if we admit the possible influence of residence in a contiguous organ (tear duct), this relation could hardly be held to explain the course of events in other cases in which ocular or other metastases originate from primary bacterial lesions in distant parts of the body.

Nevertheless, it seemed desirable to find whether an organism which had previously produced iridocyclitis in rabbits could regain this quality of localization by continued growth in the tissues of the eye. Hemolytic streptococci isolated from the tear sac April 28, produced typical iridocyclitis in three of four rabbits injected intravenously. Hemolytic streptococci isolated from the tear sac May 24, produced iridocyclitis in two of four rabbits injected. Cultures of hemolytic streptococci from the tear sac, taken on May 26, May 28, June 2, June 7, and June 16, failed to produce iridocyclitis in a total of 22 rabbits, whether injected with other organisms from broth culture inoculated directly from the patient, or

in pure culture after isolation on blood agar. That the failure of later cultures to produce iritis was not fortuitous, but more probably due to some change in the invasive power of the organism for ocular tissue seems evident from the fact that, whereas in the first 2 series, 5 of 8 rabbits injected developed iridocyclitis, in the later 5 series of cultures 22 rabbits showed no such lesions. Furthermore, in the later experiments 24 other rabbits received the same streptococcus either in pure culture or with other organisms without the production of typical iridocyclitis, such as was observed in the first 5 rabbits.

The ability of the cultures to produce lesions of the eye was lost also in transfer from rabbit to rabbit, although iritis was produced in rabbit 26 by intravenous injection of the hemolytic streptococcus from the eye of rabbit 10. This loss of power to produce iritis in rabbits was not accompanied by any demonstrably decrease in virulence for rabbits. In cultures the quality of localization in the eye was lost after the 3rd or 4th subculture, usually within a very few days after isolation. In the case of the first rabbits injected, however, cultures produced iritis 17 days after isolation from the patient.

Attempts to obtain a return of invasive power for tissues of the eye in strains of streptococci which had lost it, by growing the organisms in the living eye, were unsuccessful in one series after passage through 5 animals, and in one series after passage through 7 animals.

These experiments seem to indicate that the invasive power of an organism for a special tissue may change within a short period of time during residence in the original host, during animal passage, and in culture, without pronounced or constant changes in cultural characteristics, or in general virulence for animals. C. Z.

CATARACT.

A DISCUSSION OF SOME NEWER PRINCIPLES IN DEALING WITH UNCOMPLICATED CATARACT. — VAIL, D. T., Cincinnati (*Arch. Ophthalm.*, July, 1916, XLV, 307), believes that preliminary iridectomy in immature uncomplicated cataract is unnecessary and needless, and never indicated. He advocates the extraction of immature cataract and gives the result obtained in a series of 40 cases in which vision was 20/200 or better before operation. The author also discusses cleansing of the eye for operation, controlling the eye lids during operation, dealing with the capsule, retained lens substance, time as a factor, and the use of atropine. W. R. M.

EXTRACTION OF CATARACTS IN THE CAPSULE BY A SLIGHT MODIFICATION OF THE VON GRAEFE METHOD.—TOROK, E., New York (*Annals of Ophth.*, Oct., 1916). The writer calls attention to the fact that with the regular von Graefe method, if one uses a capsule forceps instead of a cystotome, it often happens with hypermature cataracts, where the capsule is thickened, that it does not rupture, but the zonule gives way and the lens is delivered in the capsule. This, of course, is an accidental extraction in the capsule, but it happens not infrequently where a great many hypermature cataracts are extracted. He has tried to imitate this accidental intracapsular extraction by systematically using the Kalt forceps instead of the regular capsule forceps with teeth. The operation, therefore, with which he removed the forty-three cataracts in the capsule is nothing else but a slight modification of the von Graefe extraction.

Puncture and counterpuncture are made in the limbus, with a conjunctival flap, the incision corresponding to one-half of the circumference of the cornea. After the regular small iridectomy, the pillars of the coloboma are replaced and the Kalt forceps are introduced into the anterior chamber with the left hand, while the right hand holds a Daviel spoon; the blades of the forceps are opened, and with a light pressure backward a fold of the capsule is grasped. With a few lateral and circular movements the zonular attachments are loosened. Keeping the lens now firmly in hand with the forceps, the Daviel spoon is applied somewhat below the lower limbus. Both forceps and Daviel spoon are now manipulated at the same time. With the forceps we keep up these lateral movements, but at the same time a slight and gentle traction is exerted upon the lens forward—*i. e.*, in the direction of the anteroposterior axis of the eye. With the Daviel spoon a gentle intermittent pressure is applied to the sclera—*i. e.*, the sclera is slightly indented with the Daviel spoon and immediately released, then again indented and released. This is repeated several times, the motions of the scleral wall being about the same as the motion of the wall of a pulsating artery. These manipulations usually rupture the zonule below, and the lower edge of the lens slowly emerges from behind the iris. The Kalt forceps now are slowly moved toward the wound, and the Daviel spoon, the gentle pressure with which becomes continuous the minute the zonule is ruptured, follows the lens just as in the von Graefe extraction, and the lens is delivered

with its lower edge first. The rest of the operation—*i. e.*, the replacement of the pillars of the iris and toilet—differs in no way from the usual von Graefe extraction.

He bandages both eyes for 48 hours; then the non-operated eye is left exposed. The operated eye is bandaged for a week, the dressing being changed daily. Patients are allowed to sit up in bed 12 hours after operation and in an armchair after 24 hours.

The writer has used this method of cataract extraction in 53 cases. In 37 he succeeded in removing the lens in the intact capsule; in 6 the capsule tore while the lens was engaged in the wound and after delivery of the lens it remained wedged in the wound in 4 cases and slipped back into the anterior chamber in 2; in all of these cases the capsule was removed afterward in its entirety by grasping it with the Kalt forceps and extracting it. In 5 cases the capsule tore before the zonule of Zinn ruptured and the lens was extracted in the usual (von Graefe) way. In 5 cases of immature cataracts he could not use the Kalt forceps, as they did not get hold of the capsule, but slipped off—the capsule forceps with teeth had to be used instead, and the usual von Graefe extraction performed. Vitreous was lost in 2 cases owing to pressing on the part of the patient. The recovery was, in most cases, quick and uneventful. In 4 cases there was delayed union but after a few days the wound closed and recovery proceeded as usual. In one case there was severe iridocyclitis with total occlusion of the pupil and coloboma and in two cases there was blood in the anterior chamber which absorbed slowly.

The visual results were 20/30 or better in 34 cases, 20/40 or better in 2 cases, 20/50 in one case, 20/70 in 3 cases, 20/100 in one case, and hand movements in one case.

In conclusion the writer states that in his limited experience the removal of the lens in its capsule with this slight modification of the von Graefe method is very simple and easy for anyone who is experienced in the usual von Graefe extraction. He believes that the danger of loss of vitreous is even less than in the usual von Graefe extraction, because the lens being removed by a combination of traction and pressure, the pressure to be applied is infinitely less than that used in the former method. The Kalt forceps are very well adapted for use in mature, hypermature and nuclear cataracts; they can, however, not be used in immature cataracts. In these latter cases he believes a substitute would be Hulen's suction extractor or some similar device.

C. H. M.

ON THE AMBULANT AFTER-TREATMENT OF CATARACT EXTRACTION, WITH A NOTE ON POST-OPERATIVE DELIRIUM AND ON STRIPED KERATITIS.—BRUNS, HENRY DICKSON, New Orleans (*Annals of Ophth.*, Oct., 1916). In 1907 a negro man who had misunderstood orders walked to his home five miles away after cataract extraction and returned for inspection forty-eight hours later. The eye was found in excellent condition and he was allowed to come and go until recovery. The author and his colleague, Dr. E. A. Robin, determined the next year, 1908, to treat a part of their patients after extraction as walking cases. During the year 1908 thirty-nine extraction cases were confined to the hospital and to bed, and five, or twelve per cent plus, of the operations were failures. During this year twenty-five were treated as ambulant cases and two, or eight per cent, were failures. These patients got down from the table and went to their homes afoot and in street cars. Up to 1915 two hundred and thirty-two cataract extraction patients were treated as ambulant cases and eighteen of these, or seven per cent plus, were failures.

These ambulant cases should not visit the clinic unattended. Two of the author's patients tried to reach the hospital alone, both had severe falls and their eyes were destroyed, one by iridocyclitis, the other by intraocular hemorrhages. Bandaging only one eye and allowing cataract patients to go home had eliminated post-operative dementia after cataract extraction. In this connection the author says: "The finer, the nervous organizations, or, in other cases, the greater the susceptibility of the ignorant and lowly to the dread of the unknown, the greater the pomp and circumstance of the operation, the stranger, the darker, the stiller, the lonelier the after-treatment, the more likely is the mental disturbance to occur." The writer thinks that the comfort and morale of the patient are greatly enhanced by his prompt return to his home, his family and to the thousand and one particulars summed up in the phrase "familiar surroundings." Since adopting the Blanco dressing in 1905 striped keratitis has virtually disappeared. The author attributes this to the absence of pressure on the eye from the dressing.

J. M. W.

SOME UNUSUAL TYPES OF CATARACT OPERATIONS. — FENTON, RALPH A., Portland, Ore. (*The Journal of Ophthalmology and Oto-Laryngology*, June, 1916).

The author draws the following conclusions:

No set of rules, names, or formulae should take the place of

actual physical familiarity with the feeling and the behavior of the ocular tissues concerned.

The quickest and easiest method should, other things equal, be chosen always.

All the instruments which may be necessary to a complete extraction should be on hand and ready whenever the globe is opened for lens work.

Given fair projection of light, the presence of complications (such as synechiae, corneal scars, or even transferred uveitis) should not contraindicate operation, but rather spur us to devise methods for overcoming them.

The patient should be hurried out of bed and upon his feet, rather than be kept ill in body and mind by recumbency.

Above all, let the operation be mastered; we must not let it master us.

Better a little surgical common sense than much reference to the work of others in the literature.

Consider only that, if it is made possible for one such blind laborer to leave the almshouse and take up some work again, or for one such little child to be less a family care, you will, in the old Athenian phrase, "have deserved well of the state."

G. I. H.

NINETY-FOUR CONSECUTIVE INTRACAPSULAR CATARACT OPERATIONS.—FISHER, W. A., Chicago, Ill. (*The Journal of Ophthalmology and Oto-Laryngology*, August, 1916).

Fisher believes that the usual visual results seem sufficient to give the intracapsular operation first place among the various methods. Of these ninety-four cases 58 were immature cataracts and 36 mature. Fifty-six received 20/20 or better, 38 of these being immature and 18 mature. Five of the six receiving 20/15 were immature.

It is the writer's opinion that all senile cataracts whether mature or immature would receive better visual results if operated by the intracapsular than by the capsulotomy method and this report justifies the assertion that it is not necessary to wait for cataracts to become mature, that post-operative inflammation is rare, infection practically nil, and that the author's modification of the Smith technique has practically eliminated vitreous loss.

G. I. H.

PRESENT STATUS OF THE OPERATION FOR THE EXTRACTION OF CATARACT IN THE CAPSULE.—KNAPP, ARNOLD, New York (*Arch. Ophthalm.*, January, 1917, XLVI, 27), discusses the advantages and disadvantages of the intracapsular method of extraction, as compared with the capsulotomy operation, from the standpoint of visual results obtained and the dangers of complications. He concludes that the visual results obtained by the intracapsular operation are better than when a capsulotomy is done. In discussing the dangers of complications and accidents, he refers to the necessity of having a trained assistant for the Smith operation, to the large corneal incision, entirely within the cornea as practiced by Smith and which the author believes does not heal as well as one posterior to the limbus giving rise occasionally to a riding flap and being more exposed to infection. He also refers to the danger of loss of vitreous. Communications to the author from eight American ophthalmologists, who have received training in intracapsular extraction from Smith, show that two of them do not practice the Smith operation at all, one performs it in fifty per cent of the cases, and the remaining five perform it in all cases with certain provisions. Knapp believes that the question narrows itself to the following: "Are we justified for the purpose of obtaining better vision in some additional cases to increase the number of poor results and failures directly referable to the method of operating? At the same time the extraction of cataract in the capsule is so ideal that our endeavors and the progress in ophthalmic surgery must be along lines of intracapsular extraction devising a method which is easier to perform and less dangerous to the eye than the Smith-Indian operation."

W. R. M.

CHORIOID

A CASE OF PUERPERAL METASTATIC SUPPURATIVE CHOROIDITIS.—BOYLE, CHAS. O., New York (*Jour. Ophthalm. Otol. and Laryngol.*, October, 1916). A young married woman was delivered of a dead child, the eyes became inflamed the same day. The next day symptoms of septicemia were active. In two days one eye was in an active stage of panophthalmitis. She died on the fourth day. Two subconjunctival injections were used of cyanide of mercury 1/3000, fifteen minims, but did no good. No autopsy obtainable.

M. B.

THE DIAGNOSTIC VALUE OF TUBERCLE OF THE CHORIOID.—STEPHENSON, SIDNEY, London (*The Lancet.*, Sept. 9, 1916). The writer considers that there exists some tendency to overlook the

general diagnostic value of tubercle of the chorioid. As regards affections of the meninges, the importance now attached to a naked eye, chemical, microscopic, and bacteriological examination of the cerebro-spinal fluid is doubtless partly responsible for this neglect. How simple is the diagnosis, say, of a tuberculous meningitis rendered when, in association with meningeal symptoms, the cerebro-spinal fluid is found to have lost its normal limpidity, to contain lymphocytes, and to include tubercle bacilli. At the same time it is well to remember that the discovery of tubercle of the chorioid may enable us to diagnose not only diseases of the central nervous system but the tuberculous nature of lesions of other parts of the body. In one condition, indeed, acute tuberculosis, it is the sole pathognomonic sign.

He gives the histories of three cases in which the diagnosis of acute tuberculosis was established only after the discovery of tubercle of the chorioid; in the first the diagnosis had been made of apical pneumonia; in the second, of pneumococcal peritonitis; and in the third, of typhoid. He points out that acute tubercle of the chorioid is by no means an uncommon affection; that its discovery has been facilitated by the use of the electric ophthalmoscope; that a mydriatic must, of course, be employed; and that, when necessary, it is justifiable to use a speculum and fixation forceps, or even a little chloroform, to overcome technical difficulties.

C. H. M.

CONJUNCTIVA

PHLECTENULAR CONJUNCTIVITIS AND KERATITIS.—GOWENS, JR., HENRY L., Philadelphia (*Jour. Ophthalm. Otol. and Laryngol.*, Sept., 1916), has observed that this disease is more common in children who had been bottle fed babies and that they have the more severe forms of the disease. He finds that the disease occurs not only among the poor, but also among a class of children who would be well nourished if it were not for the fact that they have their liberty in the choice of food stuffs contrary to the advice of their family physician and oculist. He regards the over use of sweets as an important cause. For those who attribute the disease to a tuberculous diathesis, there is work to be done by societies for the prevention of tuberculosis in driving from the vicinity of schools the vendor of candies and sweets who has tuberculosis or a chronic bronchitis.

Phlyctenular children should be seen at regular intervals. Any refractive error, no matter now small should be corrected.

M. B.

ADHESIONS IN THE FOLD OF THE CONJUNCTIVA OF THE LOWER LID UNRECOGNIZED FOR HALF A CENTURY.—MURPHY, FRANK G., Mason City, Iowa (*The Journal of Ophthalmology and Oto-Laryngology*, December, 1915).

A man, age 56, with a history of a fall into a pile of dry ashes, getting some of the cinders in his eye when he was four years old.

The adhesions were severed two years ago and he had had practically no inconvenience from his ocular trouble since that time, although he had suffered almost constantly from the effects of it for just fifty years.

G. I. H.

CORNEA

PRIMARY ULCERS OF THE CORNEA.—MACMULLEN, F. B., Detroit (*Jour. Ophthal. Otol. and Laryngol.*, October, 1916). By primary ulcer he means an ulcer which is usually due to traumatism, especially from foreign bodies on the cornea. It is his practice to remove these foreign pieces of matter with a flat pliable spud and to scrape away the underlying corneal area which is escharotic or necrotic. The eye is closed with a bandage and the patient is not to resume work until the eye is free from redness.

M. B.

HERPES CORNEAE "FEBRILIS," WITH SPECIAL REFERENCE TO ETIOLOGY.—THEOBALD, SAMUEL, Baltimore (*New York Medical Journal*, August 5, 1916). The writer considers herpetic keratitis more common than is usually supposed; this conviction may depend upon the fact that he has been in the habit of testing the sensibility of the cornea in every case of superficial keratitis. He uses the term herpetic keratitis in a broad sense, as Fuchs used it; neuropathic keratitis, the postmalarial keratitis of Kipp, and the dendritic keratitis of Emmert being regarded simply as types of corneal herpes, the essential and common feature of these different types being a disturbance of the nerve supply of the cornea. The writer questions the propriety of the qualifying term "febrilis"; for though herpes of the lips and face not infrequently accompanies a "cold," this is not true of the corneal variety which, if we except the postmalarial cases, more often than not occurs without assignable cause.

Beside the corneal hypesthesia, which is very rarely confined to the infiltrated or ulcerated areas of the cornea, as some maintain, the characteristic signs and symptoms of herpetic keratitis, commonly accepted, are the unilateral character of the affection; the

diffuse and irregular form of the corneal opacities, sometimes of the dendritic type, but more often presenting a maplike appearance; the persistence of the opacities notwithstanding the fact that the substantia propria is seldom deeply involved; the obstinacy of the affection, and, not infrequently, a decided tendency to recurrence. Severe pain, described by some, is not, in the writer's experience a usual symptom.

Regarding etiology, the writer believes that the primary lesion is situated in the ciliary ganglion and is comparable to that which occurs in the Gasserian ganglion in herpes zoster ophthalmicus; but, since it involves only the ciliary nerves, the resultant disturbance of nutrition, the hypesthesia and the inflammatory changes which follow are necessarily confined to the eye itself, differing radically in this respect from those which are usually observed in herpes zoster ophthalmicus, where the primary lesion is in the Gasserian ganglion, and which involve, not only the eye, but the lids, the forehead, and scalp, and exceptionally the side of the nose. He acknowledges that this is not in accord with the commonly accepted view that the ciliary ganglion is purely an efferent ganglion and hence a lesion could not cause corneal hypesthesia and the nutritional and inflammatory changes found in simple herpetic keratitis. But he contends that the correctness of the commonly accepted nature of the ciliary ganglion has not been definitely demonstrated. He quotes a number of observations bearing on this subject from the writings of various authors.

C. H. M.

TWO CASES OF BACILLUS PYOCYANEUS KERATITIS.—LAMB, H. D., CALHOUN, J. G. and ALT, ADOLF, St. Louis (*Am. Journ. Ophth.*, Sept., 1916). The writers give the histories of two patients who suffered from bacillus pyocyaneus keratitis with much destruction of the cornea the vision being reduced to counting fingers at 18 inches and 7 feet respectively, showing that this organism is not always as mild and harmless as it is generally reported to be and that certain strains are able to produce the most rapid and extensive destruction of ocular tissues; similar results have been seen by other observers.

In the first patient, there was a greyish, semitranslucent ulcer, circular, occupying the lower three-fifths of the cornea, surface slightly irregular and depth below Bowman's membrane, a peculiar thing was the almost complete absence of injection, photophobia, or other evidence of irritation, so that it reminded one, in that respect, of keratomalacia; at this time a smear showed no micro-

organisms. The ulcer spread in extent and depth with no pain and but little injection until the entire cornea was involved and perforation seemed imminent; there was subsequent scar formation with moderate staphylonia.

In the second patient the appearances of the ulcer were similar; the progress was again very rapid; there was hypopyon.

The diagnosis was confirmed by growth of characteristic pyocyanus colonies in agar tubes and by the behavior of these organisms when injected with the substance of the cornea and with the anterior chamber of the eyes of rabbits.

In conclusion the writers remark that ulcers caused by the pyocyanus have a distinct pathology of their own. Typical corneal infections by this organism when once observed and identified are easily recognized when met again. They are distinguished most certainly by their very rapid and extensive progress over the surface and into the substantia propria of the cornea, three to seven days sufficing for this bacillus to destroy corneal tissue over its almost entire extent, and in depth from one-quarter of the corneal thickness to Descemet's membrane. The suppurative process is apparently self-terminating, being unaffected by the ordinary measure for corneal ulcer. At the termination of the tissue destruction the slough is entirely thrown off and the clean transparent floor of the ulcer appears in strange contrast to the surrounding hazy infiltrated margins. The extra-cellular toxin produced by the pyocyanus is said to contain a trypsin-like ferment which would explain its amazing power of destroying corneal tissue. Its poison being extra-cellular suggests the possibility of obtaining an antitoxin by injection of the bacillus into animals just as in the case of diphtheria and tetanus. Fortunately these ulcers are too rare to warrant the formation and keep on hand of stock preparations of pyocyanus antitoxin.

C. H. M.

BUTTERMILK FEEDING AND KERATOMALACIA.—RÖNNE. H. (*Ugeskrift for Læger*, 1915, p. 493, *Abstract in Centralbl. f. pr.*, Aug. 40, p. 148), gives statistics on 35 cases of keratomalacia which shows that it is a marked seasonal disease with a maximum in May, none in summer. According to R. xerosis of the conjunctiva affects children nourished almost exclusively with carbohydrates, but also, especially in late years, those fed with buttermilk, apparently because buttermilk is more frequently than formerly ordered by physicians in dyspepsia. If the dyspepsia is improved the parents of their own accord continue with the butter-

milk until xerosis sets in. The prognosis is good if the children come under treatment in time. It consists in unmixed raw milk.

C. Z.

GENERAL DISEASES AND THE EYE

OPTIC NEURITIS FROM SYPHILITIC LEPTOMENINGITIS.—WILDER, WM. H., Chicago (*Ann. Ophthal.*, July, 1916). Syphilitic infections of the membranes of the brain most frequently occur in the arachnoid and pia mater, and it is this condition that effects so seriously the nerves of the eye, both optic and motor. While this disease has generally been regarded as a late tertiary manifestation of syphilis, numerous observations have shown that it may appear in the so-called secondary stage, and even a few months after the lesion. The lesions may be localized exudates or areas of hyperplastic vascular changes. There may first develop in the pia and subarachnoid a circumscribed inflammation which gradually leads to the formation of a grayish red granulation mass rich in cells and containing new vessels. This mass may fill in the space between the sulci, some of it may become organized, while other parts may undergo caseation. The adjacent brain substance may become involved in the process. Such gummata may vary in size from the most minute to those as large as a walnut. The smallest may be seen as points of thickening of the arterial vessel walls. The basilar meninges are probably more frequently affected than those of the convexity. To this Le Count takes exception. He describes three types of pia changes: namely, opacity or turbidity, patches of fibrous thickening and discrete focal lesions. In basilar lesions particularly changes in the vessel walls are observed. Usually several types of lesion occur in the same brain. It is in cases of meningitis affecting the base, particularly the region of the chiasm and the interpeduncular space that involvement of the nerves of the eye occur. Lesions of the convexity cause papilledema through raising the intracranial pressure. Usually the intracranial portion of the optic nerve tract is affected and the process may begin with an oedema of the nerve or its sheath, which would explain the sudden blindness in one or both eyes or in part to the field that is observed in some cases. Such attacks are often transitory. With continuance of the trouble atrophy results from organization of the round cell infiltration and granulation tissue. Unthoff found that in a hundred cases of syphilis of the central nervous system, fifty-two only presented normal fundi with the ophthalmoscope, but of these seven showed hemianopsia.

Three of these cases coming to autopsy had had no visual disturbances and no ophthalmoscopic findings, although there were distinct pathologic changes in the basal optic tracts. The general symptoms consist largely of headache and the symptoms common to brain disturbances, but the striking feature is their variable-ness, their inconstancy, their sudden changes and this is also true of the eye symptoms.

The prognosis as to vision is very uncertain, but depends partly upon the promptness of the diagnosis and the amount of damage the optic tract has suffered before effective treatment is begun. The hope of cure is not to be given up even though complete blindness has supervened.

Two cases of syphilitic leptomeningitis are reported which illustrate the insidious nature of the disease, the suddenness of development of eye symptoms and the prompt response to treatment that may sometimes follow.

M. B.

OPTIC NEURITIS AFTER INFLUENZA, WITH CHANGES IN THE SPINAL FLUID.—KNAPP, ARNOLD, New York (*Arch. Ophthalm.*, May, 1916, XLV, 247), reports a case of bilateral optic neuritis, complicating a case of influenza. There was a characteristic star-shaped figure around the macula which resembled that found in albuminuric retinitis. The field defect was a central color scotoma. After three months the ophthalmoscopic changes disappeared. Vision became 20/30. Wassermann was negative and opening the posterior nasal sinuses failed to influence the eye condition. Examination of the cerebrospinal fluid showed changes indicating a mild infection. The author attributes the eye lesions to a hematogenous infection which at the same time produced a slight toxic reaction on the part of the cerebrospinal fluid.

W. R. M.

TWO CASES OF METASTATIC OPHTHALMIA CONSECUTIVE TO PNEUMONIA.—COHEN, MARTIN (*Arch. Ophthalm.*, May, 1916, XLV, 250), reports two cases of metastatic ophthalmia. In the first case there was a double metastatic panophthalmitis complicating a broncho-pneumonia. Cultures from the vitreous fluid showed streptococci.

The second case was a metastatic endophthalmitis occurring in a pneumonia case. Cultures from the vitreous showed pneumococci.

A bibliography is added.

W. R. M.

ON FEBRIS UVEOPAROTIDEA.—LEHMANN, K. (*Hospitalstidende*, Feb. 16, 1916, 59, No. 71, p. 137. *Abstract from Jour. of the Am.*

Med. Assoc., 66, p. 1066), encountered two cases, and knows of 10 others in Denmark, of febris uveoparotidea. It represents a definite syndrome of bilateral uveitis, resembling those of syphilitic origin in some respects but absolutely rebellious to specific treatment, bilateral parotitis, low continuous fever and in half the cases, facial paralysis. The uveitis runs a chronic course and may eventuate in blindness in one or both eyes in the severer cases. In a few cases other glands besides the parotid were affected likewise. The prodrome is protracted; the first symptom may be the facial paralysis, which may keep up for three or four weeks before the uveitis or parotitis develops. The latter resembles mumps to a certain extent, but its long persistence, the absence of any known source of infection, the absence of any contagion from these cases and likewise the fact that orchitis was never known in any instance, seems to exclude epidemic parotitis. The parotitis may develop as an indolent tumor, persisting for two years. In all the cases, however, the parotid lesions and the facial paralysis entirely retrogressed in time.

A number of points differentiate this affection from Mikulicz' disease of the lacrimal and salivary glands, as Lehmann describes in detail. In nine of the twelve patients there was nothing to suggest tuberculosis or a predisposition thereto, no traces of scrofula, and the skin and subcutaneous tuberculin tests applied to three elicited a negative response. But the other three patients were undoubtedly tuberculous; the microscope revealed tuberculous tissue in the iris of one and in a gland in the neck of another. Uththoff of Breslau described an analogous case in 1909 which he explained as a case of tuberculous meningitis with tuberculous iridochorioiditis.

C. Z.

PSEUDOSCLEROSIS.—KRABBE, K. (*Bibliothek for Laeger*, 1915. *Abstract in Centralbl. f. prakt. Aug.*, 40, p. 146), found in a case of pseudosclerosis (Westphal-Strämpell's disease) a slow, phymic action tremor, bradylalia and alimentary glycosuria, otherwise normal neurological condition, typical pigmentation of the cornea in a width of 1 mm. along the limbus of both eyes. There were also total paralysis of fixation to the right, incomplete to the left, left enophthalmus, and abolished convergence.

C. Z.

THE MOST IMPORTANT SYMPTOMS OF MULTIPLE CEREBRO-SPINAL SCLEROSIS.—GJESSING, HARALD (*Norsk Magazine for Laegevidenskab*, February, 1915, p. 145. *Abstract in Centralbl. f. prakt. Aug.*, 40, p. 145), mentions in detail the ocular symptoms

of multiple sclerosis and reports five cases illustrating their importance for the early diagnosis of the disease. One case showed initial retrobulbar neuritis with central scotoma, one ptosis, paresis of the internal rectus and central scotoma, one associated paralysis of fixation, one transient amaurosis with remaining enlargement of the blind spot, one interior ophthalmoplegia. C. Z.

ON FEBRIS UVEOPAROTIDEA SUBCHRONICA.—SCHOU. S. (*Hospitalstidende* 1915, p. 151. *Abstract in Centralbl. f. prakt. Aug.*, 40, p. 149), observed a few cases of this complex which consists in iridocyclitis of slow course, slight rise of temperature, swelling of the parotis or other salivary glands, occasionally also of the lacrimal and of lymphatic glands. The glands are always affected symmetrically. The disease has nothing to do with epidemic parotitis.

C. Z.

TUBERCULOSIS OF THE RETINAL VESSELS.—JACKSON, EDWARD, Denver, Colo. (*Arch. Ophthal.*, January, 1916, XLV, 552), describes the fundus changes present in five cases of retinal tuberculosis, and adds that the clinical picture, that it is important to fix in relation to retinal tuberculosis, includes these features: Vitreous opacities, recurring retinal and vitreous hemorrhages, enlargement of the retinal veins, local lesions associated with large retinal vessels, white spots in the macula in some cases, optic neuritis, and retinitis proliferans as a terminal condition. The earlier lesions give reactions to tuberculin injections, and their involution is favored by tubercular therapy.

The article is illustrated.

W. R. M.

SCINTILLATING SCOTOMA.—SWIFT, GEORGE W., Seattle, Wash. (*The Journal of Ophthalmology and Oto-Laryngology*, May, 1916). The author's theory is that anyone is liable to an attack of scintillating scotoma whenever the kinetic system becomes overworked and the perfect harmony has become disturbed; that there are many cases of scintillating scotoma that are not of sufficient importance to the patient to warrant comment and that we do not ferret out the facts when we hear of a terrific headache.

The importance of this condition does not lie in establishing a clue as to treatment. We know the treatment is quinine. It will not stop the scotoma but it will prevent the headache. The great importance in this theory, if accepted, is that it gives to the kinetic system theory positive clinical evidence of its workings.

Swift cites four cases and gives detailed histories. G. I. H.

MIGRAINE.—WELTON, CARROL B., Peoria, Ill. (*The Journal of Ophthalmology and Oto-Laryngology*, February, 1916). The author gives his experience with 84 patients with this symptom complex, who have come to him for relief from their "sick" headaches during the past ten years.

Strictly speaking, migraine is not an ophthalmologic subject, but the visual and sensory disturbances which are referred to the eyes, bring the patients to the ophthalmologist with the result that, together with the internist and neurologist, we who are engaged in special lines of practice get an excellent chance to see and study these cases.

1st. Ordinary migraine or "bilious" headache, and by some, because of symptoms referable to the eye, called ophthalmic migraine.

2nd. Ophthalmoplegic migraine, which begins as a violent pain in the fifth nerve and terminates in paralysis of the ocular nerves, the nerve most frequently involved being the third.

3rd. Psychical migraine, in which the mental symptoms predominate in place of the usual ocular and neuralgic ones.

Welton is of the opinion that in any case that the correction of an error of refraction has *never* resulted in the stopping or permanent cure of a single case of migraine.

G. I. H.

GLAUCOMA

THREE YEARS EXPERIENCE IN SCLEROCORNEAL TREPHINING IN GLAUCOMA.—WILMER W. H., Washington, D. C., (*Arch. Ophthalm.*, July, 1916, XLV, 333), discusses the subject of trephining in glaucoma and gives the results obtained in a number of operated cases, which were kept under observation and repeated examinations made.

The author concludes, from his own personal experience, that for permanently reducing excessive tension all cases of glaucoma, except the acute form, sclerocorneal trephining is the easiest, safest and most effective method so far presented to ophthalmic surgery.

W. R. M.

THE SCLEROCORNEAL TREPHINING OPERATION FOR GLAUCOMA. A CLINICAL REPORT OF FORTY-FIVE OPERATIONS.—PARKER, WALTER R., Detroit (*Ann. Ophthalm.* July, 1916). The total number of patients was thirty-six, twenty-four being males and twelve females. Twenty-six operations were performed upon the men and sixteen upon the women. In seven cases both were trephined and in two cases the same eye was trephined twice.

The technique employed was the same as that first recommended by Col. Elliott, except that in the character of the flap. In this particular he followed Elliott's later recommendations. He thinks that the large flap, including in its lower third all the tissues down to the sclera, is a decided factor in preventing the vesicular type of filtration scar and greatly diminishes the danger of later infection.

Twenty-one of his cases were simple glaucoma, twelve were chronic inflammatory, the other twelve were 1 acute, 2 secondary to cataract extraction, 2 secondary to luxated lens, 2 secondary to trauma, 2 secondary to Uveitis, 1 hemorrhage and 2 Buthalmos. The failures numbered 15, two of which were in the simple, 5 in the chronic inflammatory. Sixteen of the simple cases and five of the chronic inflammatory were successful. The highest percentage, 76.18% were in the cases of glaucoma simplex. Complete iridectomy was performed fifteen times through the trephine opening, in thirteen it was partial, in eight no iris was removed and in nine there had been a previous iridectomy. Subsequent iritis was much less frequent where either a previous iridectomy had been done or where a good large piece of iris was removed through the trephine opening.

M. B.

DEFECTS OF THE VISUAL FIELD AND OPERATIVE METHODS IN GLUCOMA.—VAN DER HOEVE, J., Groningen (*Zeitschrift f. Aug.*, 34, p. 277). The method of Bjerrum of examining the visual field with small objects of ivory at a distance of 2 m., instead of the usual practice at about 1/3 m., has the advantage, that hereby all linear measures are projected 6 times larger, hence the scotoma 36 times larger. Thus Bjerrum ascertained that one of the first symptoms of glaucoma is the occurrence of arch-shaped, resp. ring-shaped scotomas, starting from the blind spot, encircling the point of fixation and ending blindly in the horizontal line. The usual extension of Bjerrum's scotomas is toward the periphery.

H. reports the clinical histories of 6 cases of glaucoma, which show that the scotomas may also spread toward the point of fixation, a much more dangerous occurrence as hereby the macula is threatened. His observations led him to the following conclusions:

Bjerrum's scotomas may be totally or partially relative, and generally arise from the blind spot. After operations for lowering the tension they may disappear but may also become again absolutely relative. This recession not always occurs latest at the blind spot. Every patient, suspect of glaucoma, ought to be examined for

Bjerrum's scotoma, also those with normal vision and normal borders of the visual field. Glaucoma patients ought to be treated with miotics or sclerotomy, if they can be further observed, with regard to tension and contraction of the visual field, including Bjerrum's scotoma, in order to meet alarming symptoms at once. Limitations of the visual field and Bjerrum's scotoma even in immediate neighborhood of the point of fixation are no contraindication against Elliotts' trephining, so that this operation is especially adapted for such cases. On the other hand one must weigh in every case of glaucoma to be operated on, whether iridectomy or sclerectomy is preferable.

The advantages of iridectomy are: slight or no dangers for late infection simple technic. The disadvantages are: development of wound astigmatism, danger of injuring the lens, glaring through the large coloboma, difficult operation in shallow anterior chamber.

Advantaes of sclerectomy are: less danger of the operation, no cicatricial astigmatism, no glaring, preservation of the sphincter, which is useful in later, mostly, however, unnecessary, instillations of miotics. Disadvantages are: greater complication and longer duration of the operation, and above all, late infection.

Although H. is content with the results of sclerectomy in his reported cases and in patients with hemorrhagic glaucoma, he is more pleased if a patient leaves the clinic after the glaucomatous symptoms have been arrested by iridectomy than by sclerectomy. He thinks that iridectomy also in not acute glaucoma is to be maintained as the chief operation, and sclerectomy is only to be resorted to, if iridectomy is contraindicated or has been without result.

C.Z.

BRIEF NOTICE TO REMOVING INTENSE LASTING HYPOTONY AFTER TREPHINING IN GLAUCOMA SIMPLEX WITH SOME REMARKS ON THIS OPERATION.—KUHN, H., Bonn. (*Zeitschrift f. Aug.*, 34, p. 253). 'Trephining in glaucoma simplex according to Elliott offers, aside of the not very rare late infection, in exceptional cases a second danger by lasting intense hypotony. To avoid late infection K. recommends in the first few months to keep the conjunctival sac clean by consequent instillations of disinfectant collyria or inspersions of calomel, noviform, boric acid, etc., and to render the conjunctiva more firm and resistant by touching the cushion with tincture of opium.

The hypotony after trephining naturally lasts longer than after iridectomy, sclerotomy or cyclodialysis, and the good effect of tre-

phining seems to be due to this. Generally the normal tonus is restored in from 2 to 10 weeks, sometimes longer, as K. observed, after 5 and 6 months without damage to the eye. Exceptionally a permanent hypotony develops which on account of the deterioration of the visual functions, the possible danger from slight mechanical lesions, and subjective ailments, must be remedied. The patient has the disagreeable sensation of shaken fluid in the eye on opening and closing the lids, photophobia, early tiredness, which give rise to frequent rubbing, blinking, eventually slight spasm of the lids. The conjunctiva is hyperemic and the accumulation of tears interferes with distant vision. The greater pressure of the lids resulting from these, closes the vicious circle and prevents the consolidation of the tissue filling the trephined hole. Probably the proliferation of the subconjunctival tissue for one reason or other is not sufficient or interlaced with unusually many or wide filtration gaps.

K. reports the clinical history of a man, aged 67, in whom the hypotony had persisted for 13 months, causing the mentioned distressing symptoms. For its subsidence K. performed the following operation: About 4mm. from the temporal margin of the cushion a curved flap of the conjunctiva, 7 mm. wide and 1.5 cm. long, was circumcised, the base 3 mm. from the corneal limbus, the apex in the retrotarsal fold, and was detached with the subconjunctival tissue. The whole cushion was burned off with the galvanocautery, and the conjunctival flap drawn over it and its apex, into which a double armed thread had been inserted, under the conjunctiva bordering on the nasal side, where it was fixated near the limbus. Recovery in a few days. On the 20th day the tension was 24 Hg. The eye was without irritation, and all distressing symptoms had disappeared. V rose from $\frac{5}{8}$ to $\frac{5}{6}$. No regular cushion formed. Only a slight prominence was visible, which did not have the usual glassy bluish white hyaline appearance.

K. found the following points useful in performing the trephining operation: Fixation of the eyeball by grasping the tendon of the superior rectus, formation of a conjunctival flap, 1.50 cm. wide, dissection at the limbus with a scarificator of Desmarre, removal of all episcleral tissue, excision of the most peripheral portion of the iris with preservation of the minor circle.

Finally K. reports a case of incarceration of the lens after trephining. By posterior sclerotomy the tension was lowered and after reposition of the lens by stroking the cornea from the upper border towards the center, the tension became normal and the consequences of malignant glaucoma were averted.

C. Z.

THE MEDICAL SIDE OF GLAUCOMA.—KNAPP, ARNOLD, New York (*Arch. Ophthalm.*, Nov., 1916, XLV, 544), discusses the etiology of glaucoma with particular reference to arterial tension in glaucoma patients, ocular tension in general arteriosclerosis, artiosclerotic changes in the retinal vessels in glaucoma, vascular changes in the eye in glaucoma, and relationship of nephritis, nasal empyema and nervous disturbances to glaucoma. The author classifies the forms of primary glaucoma in two groups: circulatory and nervous. He characterizes the circulatory group by congestive attacks, retinal vascular changes, and local changes in the eye which favor increased tension. The nervous variety shows dysglandular disturbances, no arteriosclerosis, and affect any type of eye, myopic as well as hypermetropic. The author considers the treatment to be operative in the first group, and in the second group that operation is indicated in some.

W. R. M.

THE TREATMENT OF GLAUCOMA.—BEEM, IONE F., Chicago, Ill. (*Jour. Ophthalm., Otol. and Laryngol.*, July, 1916). The author submits the following conclusions:

1st. The trephine operation while giving good immediate results cannot become the universal operation for glaucoma, on account of the danger of late infection.

2d. The trephine operation has been put under a severe test by the reports of late infection. In the forty-three cases cited in this paper, the results are as follows: End results not recorded seventeen, panophthalmitis four, purulent iritis two, severe plastic iritis two, bulbi one, enucleation eight, total loss of eye two, almost total loss one, recovery with reduced vision five, recovery one.

3d. The difficulty of performing a good iridectomy has caused a desire for an operation which would eliminate the difficulty.

4th. The Smith iridectomy is a rational and safe procedure, and has been used a sufficient number of cases in India, to place it as the foremost operation and the safest for reducing tension.

5th. The few cases of Smith iridectomy performed in this country are good.

6th. Any operator who can introduce a keratome into the anterior chamber can more easily introduce a thin cataract knife, and he can make a better operation for glaucoma in this manner than can be done with a keratome.

7th. The late results of the trephine operation is causing the

choice of operation to swing back toward the iridectomy and the Smith technique gives the iridectomy which reduces tension.

Beem cites two Smith iridectomy operations done by him with good results. G. I. H.

THE PRESENT STATUS OF THE SCLEROCORNEAL TREPHINE OPERATION FOR THE RELIEF OF GLAUCOMA.—PARKER, WALTER R., Detroit, Mich. (*Arch. Ophthalm.*, January, 1917, XLVI, 1), gives the comparative results obtained in a series of 71 trephine operations and 47 iridectomy operations. In the trephine cases, a previous iridectomy was done in 11 cases, a complete in 31, a partial in 15, and the iris left intact in 16. In the 11 cases in which a previous iridectomy was done, iritis followed in 18.1%. In the 31 cases, with complete iridectomy, iritis occurred in 16.1%. In 15 cases, with partial iridectomy, iritis followed in 46.6%. In 16 cases in which no iridectomy was made, iritis followed in 50%. The percentage of good results in simple glaucoma was 60.9%. All of the cases in which the remote results remained good were of the chronic non-inflammatory type. The 47 cases, operated by iridectomy, were selected as being best suited for that operation. Early results gave 72.2% good, in simple glaucoma, 75% good in chronic inflammatory, and 65.3% good in all types except simple. Results are given in six cases trephined after iridectomy had failed. Of these the results were good in five and failure in one.

The author believes that if 50% of the selected cases of simple glaucoma can be relieved by iridectomy and 50% of the remaining cases, by trephine operations, the results of 75% good would be better than most operators have been able to obtain. He also believes that deep iridectomy will be the operation of choice not only in the inflammatory cases but in selected cases of simple type, reserving the trephining operation for those cases in which the iridectomy is contraindicated or, having been performed, has failed to relieve the tension. W. R. M.

SPONTANEOUS RUPTURE OF THE CORNEA, AND DELIVERY OF THE LENS IN A GLAUCOMATOUS EYE.—ANDREW, JAMES H., Brooklyn, N. Y. (*The Ophthalmic Record*, March, 1917). On examination the eye showed a ragged tear extending from the site of the ulcer downward in both directions around the limbus approximately roughly the usual cataract incision. The iris was slightly prolapsed at the lower nasal end of the tear and a bead of vitreous was protruding. The eye was very soft. G. I. H.

HISTORICAL

HISTORICAL REMARKS ON CATARACT EXTRACTION.—HIRSCHBERG, J., Berlin (*Centralbl. f. prakt. Aug.*, 40, p. 129), gives an abstract of the anatomical part, and an exact translation of the operative part, of Silvester O'Halloran's method of cataract extraction, published in the transactions of the Irish Academy, Dublin, 1788, p. 141-142, and not easily accessible. O'Halloran made the section in the sclera, in order to avoid opacity of the cornea, with a double edged concave lance-shaped knife.

Then two Italian monographs on cataract extraction by Santerelli of 1795 and 1805 are discussed. The first one was based merely on experiments on dead bodies. Santerelli was a precursor, but not an inventor, of the linear section, with which he succeeded in a small shrunken cataract, but failed in common hard senile cataract on account of the too small section, less than 9 mm. C. Z.

PROGRESS OF OPHTHALMOLOGY DURING THE YEAR 1915.—DUNBAR, ROY, Atlanta. (*Jour. Ophthal. and Laryngol.*, March, 1916). The author states that very little in the way of marked advances has been made during the last year in the realm of ophthalmology.

The question of the vaccine therapy in certain inflammatory diseases of the eye has received some attention but less perhaps than the year previous. The fact that many obscure inflammatory conditions of the sclera and cornea are of a tuberculous character has led to a more extended use of tuberculin. G. I. H.

INJURIES

ANILIN INJURIES OF THE EYE. REPORT OF A CASE WITH DEEP ULCERATION OF THE LOWER LID.—CURDY, R. J., Kansas City, Mo. (*Arch. Ophthal.*, May, 1916, XLV, 243), reports a case of injury to the eye following the entrance into the conjunctival sac of anilin dust from a copying pencil. The case was seen a few hours after injury. Two weeks later the conjunctiva remained swollen and was covered with a sloughing false membrane, and ragged necrotic ulcer appeared on the lower lid. During the following three weeks the ulcer increased and involved the conjunctival surface of the lid to the extent of 8 mm. horizontally and from the lid margin to the fornix. The final result was a narrow symblepharon in the nasal half of the lower fornix and cicatricial entropion of the nasal half of the lid.

The author refers to some of the more serious cases reported in the literature. W. R. M.

A UNIQUE EYE INJURY.—LEWIS, FRED D., Buffalo (*Jour. Ophthalm., Otol. and Laryngol.*, September, 1916). The case of a young man is presented who sustained penetrating particles of iron in each eye, but the right eye gave no evidences of injury for two weeks. The left eye was enucleated as it was sightless and sympathetic inflammation was feared. A week later an X-ray was taken and the right eye was found to have a minute bit of metal in central lower portion of globe. The giant magnet was applied through a scleral opening but with negative results. By this time a traumatic cataract was well advanced with vision of fingers at three feet. He now began the internal administration of Apis mel. 1 x for a month. Some clearing of lens was noticeable and vision was fingers at 6 feet and in a month more the vision for fingers was 10 feet. He then increased the Apis mel. to drop doses of the tincture four times daily and expects gradually to increase it. It appears that he has had some further experience with this remedy in cases of cataract which warrant him in believing that it is a remedy of value in cataract. M. B.

ON INJURIES OF THE EYE OBSERVED IN THE EYE DEPARTMENT OF THE FORTRESS HOSPITAL AT KOENIGSBERG DURING THE FIRST SEVEN MONTHS OF THE WAR.—OLEYNICK, ROSA (*From the eye clinic of Prof. A. Birch-Hirschfeld in the University of Koenigsberg. Zeitschrift f. Aug.*, 34, p. 301), reports on 94 eye injuries, 54 of which were perforating, and of these 26 produced by rifle shots. The most severe injuries were caused by rifle shots, due to their explosive action. Cases of intraocular foreign bodies were mostly brought about by artillery projectiles. In these cases Roentgen rays and the sideroscope were of excellent help for the diagnosis.

A few cases may be mentioned. In one case the lower temporal portion of the cornea was hazy and the fundus very much veiled. In the vitreous a fine opacity was visible and behind it a whitish place. The Roentgen skiagraph showed here a piece of a projectile of the size of the head of a pin, around which an exudate of the vitreous had formed. This was absorbed after iodide of potash, inunctions, and diaphoresis, and V rose from 5/35 to 5/8.

In a case of double perforation the wound of entrance was 5 mm. from the temporal corneal limbus. The pupil reacted promptly. One and five-tenths disc diameters from the nasal border of the disc were several retinal hemorrhages and in their midst a round light colored place, the exit of the foreign body, which, as Roentgen rays revealed, was lodged behind the globe in the orbit. The macula was perfectly intact and V 5/5.

Eleven cases of contusions were observed with deleterious changes of the interior of the eyeball by injuries of the orbital bones, the eyeball not being struck by the projectiles. Their effect on the eyeball consists in sudden indentation of the posterior pole, leading to rupture of the tense intraocular tunics, especially the chorioid, and profuse intraocular hemorrhages. After their absorption isolated typical ruptures of the chorioid, concentric to the optic disc, were found, or the retina and chorioid showed multiple and irregular tears with secondary cicatricial processes, which appeared as whitish irregular, partly pigmented, foci (retinitis proliferans). The sudden indentation further leads to increase of intraocular tension, the whole contents are driven forwards, which may be followed by detachment of the retina, dislocation of lens, iridodialysis, but the effect of contusions, is mostly limited to the posterior segment of the eyeball. In four injuries of the optic nerves the eyeball appeared without irritation, only the wide immovable pupil suggested the lesion.

C. Z.

THE RESULTS OF WARNINGS SENT OUT BY THE OPHTHALMOLOGICAL SOCIETY NOT TO OBSERVE THE ECLIPSE OF THE SUN WITH UNPROTECTED EYES.—LUNDGAARD, K. (*Hospitalstidende*, 1915, p. 1097. *Abstract in Centralbl. f. prakt. Aug.*, 40, p. 1471. After the eclipse of the sun of 1913 reports of more than 143 cases of scotoma due to it were collected by the Ophthalmological Society of Copenhagen. Before the eclipse of 1914 the Society sent out warnings to the newspapers not to observe the eclipse with unprotected eyes. After the eclipse only one case was reported in a man who never read a newspaper.

C. Z.

CRANIAL SHOTS AND OPTIC NERVE.—LOEWENSTEIN, ARNOLD, and NEUHALUS, E. R., Prag (*Medicine Klinik*, 1916, No. 16). 32 out of 57 injuries of the skull showed inflammation or choking phenomena at the optic disc. In 23 skull injuries with optic neuritis paralysis remained up to recovery (respectively death), excepting one, while the paralysis disappeared in all six cases with normal optic nerve. Hence changes of the optic disc in skull injuries were always a bad omen. Out of 32 ophthalmoscopically positive cases six were not infected, 26 infected. In the six clean cases the dura was intact and there was increase of intradural pressure. In the 26 remaining cases the dura was opened. The various consequences of skull injuries, increase of intracranial pressure on one side, supuration of exposed parts of the brain in open dura without in-

crease of pressure on the other, cause ophthalmoscopically visible changes of the disc (edema from compression, resp. inflammation) which so far cannot yet be differentiated with the ophthalmoscope.

C. Z.

A FEW CASES OF TRAUMATIC CHORIORETINITIS.—LODBERG, C. V. (*Hospitalstidende* 1915, p. 278. *Abstract in Centralbl. f. prakt. Aug.*, 40, p. 147), reports on ten cases of chorioretinal changes from contusions of the eyeball by blunt traumatisms, viz., in nine more or less acute pigmentations of the papillo-macular region, in five, edema of the retina, eventually with red spots at the fovea in two, in three stellate figures at the macula, in two chorioidal patches like ruptures, developing a few days after the injury, chorioidal ruptures, in four late peripheral chorioretinal changes on larger areas of the fundus. In contrast to chorioretinitis from other causes the visual field is characterized by an absolute defect. In all cases vision was very much impaired immediately after the lesion, in one-half of them, it remained so, with central scotoma. The author considers it most probable that some cases, especially those of the late group, are to be explained according to the theories of Wagenmann and Siegrist as consequences of ruptures of the chorioidal and ciliary arteries.

C. Z.

ON A CASE OF LACERATION OF THE OPTIC DISC BY RIFLE SHOT.—BIRCH-HIRSCHFELD, A., Koenigsberg (*Zeitschrift f. Aug.*, 34, p. 289). A soldier, aged 28, was injured by a rifle shot on August 3, 1915. He was unconscious for quite a time, and after recovery noticed that his right eye was blind. On admission November 26, 1915, B. found a scar of the wound of entrance in the middle of the forehead above the root of the nose, and the place of exit on the right side of the neck in the middle point between the right inframaxillary angle and the insertion of the sternocleidomastoid muscle. The right eye and its surroundings showed no external changes. It deviated a little outward, the pupil was enlarged and reacted slightly to light. The motility upward and downward and inward was somewhat impeded. V fingers at 1 m. eccentrically, visual field reduced to a small irregular area at the nasal side of the point of fixation.

As the vitreous was only slightly opaque, a good ophthalmoscopic view was obtained. The disc appeared to be vertically separated into two parts. Both parts had a reddish color, and from each numerous arteries and veins emerged, which could be traced far into the retina. The separating surface was covered by a greyish

white new formation, projecting into the vitreous, which by a prominence at the nasal side of the disc was connected, with a narrow scar of the chorioid, and spread, growing larger, over the macular region. Here it was merged into an extensive chorioretinitic focus with pigment displacements and greyish white patches. The same focus communicated with a chorioidal scar encircling the nasal side of the disc and sending a wide process downward and outward. The temporal portion of the retina showed a flat detachment.

B. diagnosed an oblique laceration of the optic disc and a gaping wound of the sclera, which probably was at first filled with blood and later after its organization with new-formed glia and connective tissue. It was peculiar that the torn optic nerve did not become totally a trophic and that the stem of the central artery was not also severed. If this had been the case, neither the preservation of a small area of the visual field nor the good color of the disc could be explained. The new formation projecting into the vitreous resembled analogous phenomena that happen after evulsion of the disc and were observed and described by the author in a case of evulsion of the optic nerve.

The condition had not changed after six weeks. B. does not expect this in the future, as four months had elapsed after the injury.

C. Z.

UNLOCALIZED INTRACRANIAL INJURIES.—EVANS, C. A., Milwaukee, Wis. (*American Journal of Surgery*, December, 1915), emphasizes that in all cases of skull injuries the important lesion is the injury to the brain and other cranial contents produced either by the trauma or by the resulting circulatory disturbance. As the symptoms of intracranial injuries merge into one another they should be looked at from the viewpoint of intracranial pressure, whether or not due to a contusion, hemorrhage or edema, or whether or not there is a fracture. The important point is the amount of this pressure and the ability of the brain to withstand it. An injury of the brain is followed by edema, round cell infiltration, and, if severe, an extravasation of blood. This process of reaction is a space restricting process, a compression. In E.'s experience a fairly reliable method of determining the presence and amount of intracranial pressure has been a lumbar puncture, and he believes that this should be a routine procedure in every case of suspected intracranial injury, as it will also be relieving this pressure aid in the recovery.

After speaking of localized and unlocalized intracranial injuries E. suggests in the latter class the more general use of the split muscle subtemporal decompression and drainage operation after the method of Cushing as the operation of choice. It relieves the pressure by draining away the cause of the space restriction, whether cerebrospinal fluid or blood, and by the removal of a portion of bone from the temporal region allowing for a certain amount of expansion of the brain. Since 1909 E. has performed the operation in 33 cases of unlocalized intracranial injuries, the majority of them, cases of basal fractures, not as a routine procedure, but only in those cases where he felt that it was indicated to save life or to prevent further complications, and when in doubt 9 of the 33 cases died, a mortality of 27%. Taking the average mortality, following such injuries, without operation, at 50%, this is a reduction in mortality of about 23%.

From his experience E. points out the following: In compound fractures of the vault with an uninjured dura and evidence of a subdural clot it is more advisable to open the dura and deal with the clot through a subtemporal opening than through an opening in the dura at the site of the injury. The subtemporal opening is suggested as the one of choice in a middle meningeal hemorrhage. If the findings at operation on one side are not sufficient to account for the symptoms or if there is no improvement, the opposite side should also be opened. The sooner after the injury the operation is done the better the prognosis. A "decompression" without opening the dura is not a decompression and of no use. A decompression alone is not sufficient and a basal drainage must also be done, and to insert the drain the base of the brain should be elevated.

The clinical histories of five cases are reported in detail. In one the subdural hemorrhage was on the side opposite to the choked disc and in another case on the same side as the marked choked disc. Both cases demonstrate the value of choked disc and increased blood pressure in the diagnosis of intracranial tension in the so-called closed cranial injuries.

C. Z.

THE TRAUMATIC TRANSPLANTATION OF CILIA INTO THE ANTERIOR CHAMBER.—BEGLE, H. L., Detroit, Mich. (*Arch. Ophthalm.*, January, 1917, XLVI, 47), refers to the entrance of cilia into the eyeball in penetrating injuries and during operative procedures on the eye. He refers to the complications that may arise from the pressure of cilia in the eye, such as recurrent irritation, plastic

inflammation, and epithelial tumors or cysts. The author discusses the method of removal and reports three cases. W. R. M.

ESKIMO SNOW BLINDNESS AND GOGGLES.—DALAND, JUDSON, Philadelphia, Pa. (*Ophthalmic Record*, March, 1917). After visiting among 3,000 Eskimos the author comes to the following conclusions:

- (1) The Eskimo possesses no immunity from snow blindness.
 - (2) Snow blindness occurs on cloudy days or dark days as well as on sunny days.
 - (3) One attack of snow blindness predisposes to another.
 - (4) Snow blindness occurs in animals.
 - (5) Excellence of snow goggles invented by a primitive people in preventing snow blindness.
 - (6) The association of conjunctivitis and corneal erosions with chorioretinitis in snow blindness.
 - (7) The Ultra Violet Ray causes conjunctivitis, corneal erosions, and possibly chorioretinitis.
- G. I. H.

TREATMENT OF PENETRATING INJURIES TO THE EYEBALL.—WOODRUFF, HARRY W., Joliet, Ill. (*Jour. Ophthal., Otol. and Laryngol.*, December, 1916). The author cites three cases and concludes with the statement, "While recognizing the importance of prompt surgical interference when indicated, sufficient time should be given for the careful collection and weighing of all the available evidence and then, like the wise judge, decide and act."

G. I. H.

INSTRUMENTS AND METHODS OF EXAMINATION

A HAND MAGNET OF THE INNER POLE TYPE.—GRADLE, HARRY S., Chicago (*Annals of Ophth.*, October, 1916). The author has designed a powerful, light weight magnet for ophthalmologists whose foreign body work is insufficient to warrant the expense of a giant magnet. The instrument consists of a coil of insulated wire contained within a vulcanite cylindrical casing, 12.5 centimeters in diameter and 4.3 centimeters thick.

In use, the solenoid is laid over the patient's eyes with the aperture corresponding to the palpebral fissure. This aperture in the coil has a diameter of 4.5 centimeters, and the entire instrument weighs 1.28 kilograms. Accompanying the coil are five iron pencils or inner poles. Various investigators all agreed that the inner pole magnet has an advantage over the permanent pole type in

that the lines of magnetic force emerge from the plane of the solenoid in nearly parallel lines, instead of along divergent lines, thus giving increased power. The author's magnet is connected to a 110 volt direct current circuit without any change in voltage or amperage. The author gives a brief description of a device which he has contrived to test the power of the magnet. He says that the small type of inner pole magnet offers the following advantages: 1. The price is low. 2. The foreign body is removed by the manipulation of the magnet, not by the manipulation of the patient's head. 3. The working part of the magnet is light. 4. The power is greater than any of the present forms of hand magnet. 5. The operator's view is at all times unobstructed.

J. M. W.

A UNIFORM VISUAL TEST-OBJECT.—EWING, A. E., St. Louis, Mo. (*Am. Jour. of Ophth.*, December, 1916). This visual test-object, which was presented at the 1916 meeting of the American Ophthalmological Society, is a modification of the three line one and five minute test-object of Snellen, by placing a one minute break in the center of the middle line, thus locating the one minute visual test at the center of the object, instead of at the side, as in the Landolt **C** which is now the International test-object. To make the test available for practical application it is combined with the three line test of Snellen in any grouping that may be desirable, and it is read by locating in the group the figure that contains the broken central line.

Although no test will probably ever be devised that will supersede letters or characters, because of the greater ease and rapidity with which these are read, this one offers an excellent final test for comparison with the letters or characters, as there is no variation in its form and position. It has the advantage over letters that it can be employed with any nationality, illiterates and children. In the plates accompanying the description it is arranged in groups of 2, 3, 4 and 8, and it is read by designating its position in the group as up, down, left up, right down, etc.

For the interval in the graduation, the geometrical scale of Green, $r=2^3\sqrt{1.2596}$ in increasing progression, or $r=2^3\sqrt[3]{\frac{1}{2}}=0.7937$ in decreasing progression, has been employed, as it is the most perfect scale that has so far been devised, and is equally applicable to both distant and near vision. The notation is in the metric system for both the near and the distance charts. Memorizing may be prevented by turning the chart in different positions.

In the combination with the three line standard test of Snellen,

this test also becomes valuable for the detection of astigmatism, which is revealed by some of the lines in the group being blurred. As the lines as well as the break in the smallest group that is clearly seen, are the extreme visual test for every eye that is examined, the figures of the group may be employed as an exceedingly delicate test in the correction of astigmatism for any visual acuity.

C. H. M.

A METHOD OF EXAMINING THE ANTERIOR SEGMENT OF THE EYEBALL.—LUCANUS, HANAU (*Arch. f. Aug.*, 81, p. 197). The eye is illuminated with the ophthalmoscope from a distance of about $\frac{1}{2}$ m. through convex 6, held as far as possible from the eye, by which a double linear magnification of the cornea is obtained. Thus details may be recognized, which on oblique illumination and the loupe mirror are scarcely visible, e. g. light colored foreign bodies and minute lesions of the epithelium are marked as black points or streaks. Any recent inflammatory focus of the cornea appears dark, any old healed area light, i. e., only slightly opaque. Very fine dust-like deposits on Descemet's membrane in incipient iritis come into view as a vertical line of minute dust particles, below the center of the cornea toward the margin, which cannot be seen otherwise. Also the incipient opacities of the lens, accumulation of very fine dust at the posterior surface of the lens in some forms of uveitis, and the slight opacities in the anterior portion of the vitreous, can be easily detected. The essential point of the method is the combination of incident and reflected light. C. Z.

THE VALUE OF PERIMETRY. A NEW INSTRUMENT AND SOME EXPERIMENTS DESCRIBED.—BISSELL, E. J., Rochester, N. Y. (*Jour. Ophthalm., Otol. and Laryngol.*, August, 1916). This paper deals elaborately with perimetry and campimetry and must be read in the original to be appreciated. The author describes and illustrates his two point alignment instrument which is used especially in campimetry. It permits the patient to remove his head and rest and replace it so that his eye will be in exactly the same position. The author thinks that the importance of the visual fields for form, colors, scotoma and especially for the blind spot are only now becoming appreciated, and that as more men take it up and familiarize themselves with the new methods its truths will be proven.

M. B.

A NEW SELF-REGISTERING PERIMETER.—SCHLÖTZ, H. S. (*Norsk Magazine for Laegevidenskap*, September, 1915. *Abstract in Cen-*

tralbl. f. prakt. Aug., 40, p. 148), devised a self-registering perimeter with arc of 33 cm. radius. The slide is very little visible and is operated by a thin metal spring, which is rolled up. The motion is transmitted by a cock wheel and cock rod to a pin which is pressed against a blank by means of a spring mechanism. C. Z.

IMPROVED CAPSULE FORCEPS FOR INTRACAPSULAR CATARACT EXTRACTIONS.—VERHOEFF, F. H., Boston (*Arch. Ophthalm.*, September, 1916, XLV, 479), states that, in almost all of his extractions for senile cataracts, he grasps the lens capsule with forceps, gently dislocating and removing the lens, while at the same time he makes pressure on the cornea. He has found this method successful in immature and hypermature cataracts, and also in congenital cataracts in adults over thirty years of age. He makes the incision only slightly larger than for the ordinary method, and grasps the capsule as low down as possible. Atropine is used to dilate the pupil. After the capsule is grasped, the first movement should be to bring the lens directly forward toward the cornea, then it should be gently pulled out while deep pressure is made along its lower edge through the cornea by means of a strabismus hook.

The author describes a forceps which he has devised and which is a modification of the Kalt forceps. W. R. M.

MAKING THE OPHTHALMOMETER MORE HELPFUL.—MITCHELL, S., Hornell, N. Y. (*The Ophthalmic Record*, March, 1917). To have the focal center of the patient's cornea coincide with that of the lenses in the telescope, Mitchell uses a piece of plain white paper two inches square, having an aperture $\frac{1}{8}$ of an inch in diameter in its center. This square of paper is slipped over the end of the telescope, and the patient is instructed to look at the round center that presents in the square field of white. Since adopting this simple procedure, he does not recall a single failure to secure the desired result. G. I. H.

IRIS

ON HEREDITARY TRANSMISSION OF THE COLOR OF THE EYES.—STÖREN (*Tidskrift for den norske Laegeforening*, 1915, p. 553. *Abstract in Centralbl. f. prakt. Aug.*, 40, p. 146), examined the color of the eyes of individuals of the same sex, frequently in three generations. In seven families, in which both parents had brown eyes, five boys had blue, seventeen boys brown, six girls blue, ten girls brown, eyes. Also in families, in which both parents had

blue eyes, in a series of cases children with brown eyes were found, even in a case where both parents and all four grandfathers and grandmothers had blue eyes. Hence no constant rule for hereditary transmission of the color of the iris seems to exist. C. Z.

LACRIMAL DISEASES

NEW METHOD OF EXTIRPATION OF THE LACHRYMAL SAC WITHOUT RESULTANT SCAR—REPORT OF TWO SUPPLEMENTAL CASES.—KEARNEY, J. A., New York (*Jour. Ophthalm., Otol. and Laryngol.*, October, 1916), proposes a new operative technic as follows: "Ether anesthesia should be administered, although it is possible to excise the sac by a local anesthetic injected into the skin about it. Press thumb over sac area, then flush the conjunctival cul de sac with a saturated boric acid solution. Bowman's No. 1 probe is passed down both canaliculi to the bone; Weber's knife is then passed down both canaliculi making the usual Bowman slit; a curved bistuary severs the bridge of tissue that connects the distal ends of the canalicula incisions. The anterior lachrymal crest is then located and the internal canthal ligament is divided at its insertion here. Through the incision special curettes are entered that break up the diseased sac and carious bone beneath and the debris is then scraped away. The canaliculi are scraped also. The excised area is then cleansed with a swab saturated in 1 to 500 bichloride solution. A bandage is then applied just firm enough to keep the walls of the operated area opposed and to prevent swelling. The after-treatment consists of the renewal of the bandages for three or four days."

Two cases are reported in which success attended this method.
M. B.

THE CONSERVATIVE TREATMENT OF THE AFFECTIONS OF THE LACHRYMAL DRAINAGE APPARATUS.—RISLEY, S. D., Philadelphia (*Therap. Gazette*, September 15, 1916). The writer calls attention to the uselessness, objections and dangers of indiscriminate probing of the tear duct in affections of the drainage apparatus. He advocates conservatism in such treatment and outlines his own procedure as follows: He dilates the punctum and canaliculus and washes out the sac with syringe; then 4 per cent cocaine followed by 1:5000 adrenalin is carried into the sac and allowed to remain for ten minutes, the nose sprayed with these solutions at the same time. After the physiologic action of these drugs it will often be found possible to carry an alkaline wash through the nasal duct. When this succeeds the sac and duct are then irrigated either with

a solution of silver nitrate, 1 grain to 1 ounce, to be followed in a few minutes by the alkaline wash, or by a light wine-colored solution of tincture of iodine. Failing in the attempt to pass fluids through the nasal duct, twenty-four hours later the treatment is repeated. In the meantime cold compresses in acute cases are directed at home, and frequent instillations of a mild alkaline and astringent wash to the conjunctival sac. If it is still found impossible to irrigate the nasal duct, the lower canaliculus is slit, being careful to avoid cutting the common duct. A fine ductile probe with a fine bulbous extremity is then passed into the sac and a careful but persistent attempt made to pass it through the nasal duct. Failing in this, a No. 3 or No. 4 of the Bowman's series is substituted. If it does not pass without great force, the attempt is abandoned and treatment continued. It is in his experience very rarely that these conservative measures do not sooner or later succeed. When accomplished the prognosis is good for a speedy recovery. The duct once rendered physiologically patulous, the more or less chronic inflammation of the sac recovers under the stimulating and sterilizing influence of the iodine solution, repeated as frequently as may be required.

C. H. M.

A CASE OF BOTULISM WITH BILATERAL PARALYSIS OF SPHINCTER OF IRIS AND MUSCLE OF ACCOMMODATION.—HOEG, NIELS (*Hospitalstidende*, 1915, p. 300. *Abstract in Centralbl. f. prakt. Aug.*, 40, p. 146), examined a patient who after eating preserves a few days previously, suddenly fell ill with severe headache, vomiting, blurred sight, constipation and dryness of the throat. The sphincter of iris and muscle of accommodation of each eye were completely paralyzed. There was dry pharyngitis, dryness of the skin, emaciation and loss of strength. In the course of a few months the symptoms disappeared, first the constipation, then the eye affections, while the sensations of dryness and emaciation lasted for a long time. The affection was ascribed to botulism. C. Z.

LENS

SPONTANEOUS ABSORPTION OF OPACITIES IN THE CRYSTALLIN LENS.—BROWN, SAMUEL HORTON, Phila., Pa. (*Annals Ophth.*, July, 1916). The writer gives the detailed histories of three patients, each presenting incipient or immature cataract, in whom there was spontaneous absorption of the lenticular opacities. He calls attention (1) to the importance of the early recognition of the causes of apparently trivial disturbance of vision that resist

ordinary treatment in persons past middle life, (2) the distinction between purely conventional or academic vision, as expressed by the test type, and vision of a practical or elastic character that would permit of the pursuance of a vocation normal to the particular individual, and (3) the value of ocular rest in the stage of swelling in incipient cataract.

In commenting upon the histories presented, he points out the well-known fact that lenticular opacities in persons past middle life may remain stationary or may undergo incomplete, very rarely complete, absorption; and he brings forward the suggestion that opacities beginning in the periphery and assuming a spoke-like distribution in the course of generalized haziness and apparent segmentation of the lens be given the benefit of the conservative treatment as long as vision of 5/15 can be obtained, and that the diagnosis of incipient cataract be withheld as long as useful vision can be maintained by the use of correcting lenses, reserving the diagnosis for the cases where the progress to maturity from month to month is more pronounced.

C. H. M.

LIDS

SOME GENERAL REMARKS ON THE OPERATION OF CICATRICIAL ECTROPIUM.—KUHN, HERMANN, Bonn. (*Zeitschrift f. Aug.*, 34, p. 258), gives his experiences from 222 blepharoplasties performed by himself. First he emphasizes two important general points: Blepharoplasty ought only to be attempted after not only the injury, cauterization, suppuration, are entirely healed, but also the subsequent cicatricial process is completed and the infiltration of the surrounding and underlying tissues has subsided. In order to avoid any possibility of infection, there must not be any suppuration in the face, nose, accessory sinuses, ear, on the head, or neck.

In detaching the ectropic lid, the incision must not be made near the ciliary border, but as far as possible, at least from 5 to 6 mm., distant from it. If the whole horizontal extent of the lid is ectropic, K. incises at the lower margin of the eyebrow, resp. the uppermost part of the cheek, and very carefully dissects the skin by flat cuts from the underlying scar to or near to the ciliary margin, so that if brought into normal position the lid is free from any traction. The scar must be excised as radically, as possible, especially all tough strands radiating into the depth and vicinity. This cannot be sufficiently done if the whole surface is a scar adherent to the bone. Here some horizontal and vertical deep incisions or excision of narrow stripes have proved to K. very beneficial.

Very important are also the applanation of the wound surface after excision of the scar and the smooth trimming of the wound edges, which should be undermined for 0.5 cm., and finally the stopping of hemorrhage.

The third act of transplantation of pedunculated or non-pedunculated flaps and the advantages and disadvantages of either method is critically discussed in detail. For covering larger defects K. hesitates to use pedunculated flaps. He attributes the claimed homely thickening and puckering of pedunculated flaps to insufficient elimination of scar tissue and to inadequate fixation on the wound surface and its edges. This is avoided by fixating the flap on the surface by double armed catgut inserted in the surface of the wound and carried from the corresponding wound surface of the flap to the epidermis. The necessary equal spreading of the flap in its whole thickness is thus secured by these sutures in consequence of greater tension in the stroma in the depth and lesser on the surface. The shrinkage of the flap amounts to scarcely more than one-fifth of the circumference.

The non-pedunculated flap, taken from the upper arm or thigh, must be at least twice as large as the defect. The wound surface must be much larger than the later lid. This is attained by undermining the wound edges for 0.5 cm. and by inserting near the lid border double armed sutures from the mucous membrane to the epidermal side, 2 mm. distant, for formation of the upper lid, stretched toward the forehead, for the lower lid toward the cheek. The broad overlapping of the border of the flap by the well nourished surrounding skin serves as an ideal protective covering by living tissue against immigration of micro-organisms. After a few days the superimposed edges of the flap and the surrounding skin retract and are in linear contact. Accumulation of wound secretion may be drained by one or two incisions about 1 cm. long in the lower portions of the flap.

K. had the same good results with transplantation of one or two larger flaps as with smaller pieces according to the method of Thiersch. The latter is easier, while the larger flaps give a more uniform appearance. In both procedures a subcutaneous panniculus of fat develops, so that the skin becomes folded and can be lifted, and a certain degree of sensitiveness. K. considers pedunculated flaps absolutely contraindicated in complete cicatricial degeneration of the skin with adherence to the underlying tissues, relatively in extensive cicatrization in the surrounding cheek, temple and forehead, especially with adherence to the bone. It is

indicated in such deep destructions, that only the conjunctiva remained, because then the transplantation of firmer tissue is necessary, also in poorly nourished, dyscrasic individuals, if the cornea is threatened and a speedy interference is required. K. prefers for the lower lid, whose movements are moderate, pedunculated flaps for the upper lid non- to relapses papilloma may show a certain malign character.

The fact that the patient had suffered from granulositis was of interest, as previous inflammations and injuries not rarely play a role in the etiology of papilloma of the conjunctiva. The contact implantation spoke more for a primary proliferation of the epithelium than of the connective tissue. B. found in literature only four other cases in which an inoculation of tumors on an opposite part of the eye could be ascertained with surety.

With regard to the treatment of papilloma B. says that some authors reported good results with radiation by Roentgen rays and by mesothorium. C. Z.

MATERIA MEDICA AND THERAPEUTICS

THE ECONOMICAL USE OF SOLUTIONS OF COSTLY ALKALOIDS FOR OPHTHALMIC PURPOSES. — HARMAN, N. BISHOP, London (*Brit. Med. Jour.*, August 5, 1916). Solutions of cocaine and homatropine are sufficiently costly at any time to render a method for their better preservation and economical use worthy of note. At the present time their cost is such that economy is more than desirable—it is a necessity. For the past four years the writer has had solutions of the various alkaloids required for eye work made up with minute quantities of antiseptic drugs which seemed superior to those in common use and were added to ophthalmic solutions without objectionable effect. This solution is used as a solvent in place of distilled water. It is made up as follows: Distilled water 1 pint, methyl salicylate 2 grains, oil of gualtheria 2 minims, and tincture of iodine 2 minims; after being well shaken and left 48 hours, it is ready for use. There is a slight odor which is not unpleasant and a slightly increased sting when a drop is instilled. Such solutions keep indefinitely and remain sterile even when used for several months in out-patient practice.

Solutions that have such a consistency that they can be lifted on thin rods are much more economical than solutions of the consistency of water. A minimal quantity of the viscid fluid can be lifted and inserted within the pouch of the lower lid with certainty; the watery solution has to be dropped in with a pipette, and much

of it may overflow the lids. Further, it is found that viscid solutions spread over the whole surface of the conjunctiva rapidly, and cling thereto, so that they are absorbed at all points and the effect is maximal. For this reason solutions of the pure alkaloids in castor oil have enjoyed a considerable popularity, particularly the solution of homatropine and cocaine, 2 per cent of each, for the purpose of securing cycloplegia. Recently the dearth of the pure alkaloids of homatropine made a return to the use of homatropine hydrobromate necessary. The salt cannot be dissolved in oil, and the unsatisfactory nature of the watery solution in waste and uncertainty of operation was in marked contrast with experience of the oily solution of the pure alkaloid. To get over this difficulty solutions of homatropine hydrobromate and cocaine muriate prepared with the antiseptic solvent were thickened by the addition of gum arabic until the fluid was sufficiently viscid to cling in a fair round drop to a lacrymal probe; such solutions remain free from growth of moulds and remained sterile for a long period. It was found that cocaine, atropine, eserine, homatropine, and homatropine with cocaine are equally effective in this gummy solution, and the economy of their use was noteworthy. C. H. M.

CATARRHAL CONJUNCTIVITIS TREATED WITH OPTOCHIN.—HAGEN, S. (*Tidsskrift for den norske Lægeforening*, February, 1915, p. 156. *Abstract in Centralbl. f. prakt. Aug.*, 60, p. 165), cured an obstinate one-sided conjunctivitis, without affection of the lacrimal duct, with instillations of optochin, three times a day, in one week, after it had not yielded in four months to nitrate of silver and argyrol. C. Z.

OPTOCHIN IN SERPENT ULCER OF THE CORNEA.—LEHMANN, KRISTINE (*Ugeskrift for Læger*, 1915, p. 1785. *Abstract in Centralbl. f. prakt. Aug.*, 40, p. 147), had good results with optochin in serpent ulcer, even in cases in which pneumococci could not be found. C. Z.

A REPORT OF SIX CASES TREATED WITH TUBERCULIN, INCLUDING CASES OF KERATITIS, CHOROIDITIS AND CYCLITIS.—CLAPP, C. A., Baltimore (*Ann. Ophthal.*, July, 1916). The reports of six cases are given in detail with the amount and frequency of T. R. administered. There were three cases of keratitis, two of cyclitis and one of choroiditis. All of the cases showed a focal reaction which confirmed the diagnosis of tuberculosis, and in the author's

opinion no case should be considered as positive unless a focal reaction is obtained at some time. Several of these cases were given a very grave prognosis, and would probably have been lost under old methods. The action of tuberculin in ocular lesions seems to be more marked when slight focal reactions occur. The visibility of a focal ocular reaction is so readily observed that the dosage is easily graduated. Our therapeutic armamentarium has been very decidedly increased by tuberculin in these serious eye lesions.

M. B.

LOCAL OR CONDUCTION ANESTHESIA? WITH REMARKS ON AFTER PAIN.—ELSCHNIG, A., Prag (*Zeitschrift f. Aug.*, 34, p. 207), formerly used for operations in the orbit exclusively local anesthesia, which is still the method for minor procedures on the eyelids and the surface of the eyeball. As it had, however, some shortcomings in enucleation and exenteration, he devised his conduction anesthesia or ciliary ganglion anesthesia from the apex of the orbit by injection of a small quantity of concentrated solution which he considers as the ideal anesthesia for enucleation and exenteration. It was described by Loewenstein in *Klin. Mon. f. Aug.*, 46, 1908, p. 592, to which he refers.

E.'s method of anesthesia for extirpation of the tear sac is this: 1. Injection of 1 ccm. of a 2% solution of cocaine into the tear sac. In the very rare cases in which the nasolacrimal duct is still permeable, one must be careful lest the cocaine flows into the nasopharynx. 2. Insertion of the needle about 2 cm. below and 1 cm. outside of the inner canthus into the skin, painted with iodine. Under slow injection the needle is pushed to above the inner commissure into the region of the trochlea and in all 1 ccm. injected, especially here when the trochlear nerves are reached. Then the needle is retracted and carried along both sides of the tear sac on the periosteum and again 1 ccm. of 1% novocain solution with suprarenin is injected. In very sensitive persons or in inflammation of the tissue around the tear sac E. injected a few drops of 1% cocaine solution subcutaneously into the region of the trochlear nerves. This seemed to accelerate the onset of anesthesia considerably. E.'s method was very satisfactory in more than 500 extirpations of the tear sac or dacryo-cystorhinostomies without the least disturbance, even in children. In all major operations on the surroundings of the lids small injections of concentrated solutions were preferable to infiltration anesthesia.

E. never observed after his ciliary ganglion anesthesia any after pain to speak of. In enucleation in intensely inflamed orbital tissue

the inspersion of anesthesia 0.5 or 1.00 might be tried, according to G. Hotz, who recommended it for alleviating the after pain in larger wounds.

C. Z.

EXPERIMENTS WITH THORIUM X ON THE EYE.—STARGARDT, K., Bonn (*Zeitschrift f. Aug.*, 34, p. 195), injected neutral solutions of Thorium X, in quantities equal to the radiation of 0.0045 resp. 0.00225 mg. radium bromid into the anterior chamber, and solutions equal to the radiation of 0.009 radium bromid into the vitreous, of rabbits and reports on his experiments in detail. From two to four weeks after the injection into the anterior chamber a very characteristic decoloration of the iris was observed, due, as the histological examinations showed, to a decay of the chromatophores and more or less severe lesions of the remaining tissue of the iris, especially the endothelium and the walls of the blood vessels, and of the endothelium of the cornea, sometimes leading to its complete destruction.

Injections into the vitreous destroyed directly or indirectly the parts of the eye, most important for vision: Liquefaction and opacities of the vitreous from accumulation of lymphocytes, destruction of all layers of the retina, necrosis of the retinal vessels, atrophy of the optic disc and obliteration of the vessels, disappearance of the stroma cells of the chorioid and changes of the chorioidal vessels like those of the retinal vessels.

The ciliary body showed strikingly slight alterations. Clinically the iris presented no changes, but histologically the chromatophores were disintegrated, and the vascular endothelia were slightly affected. The cornea, especially the endothelium, was normal in all cases. The lens fibers were swollen or converted into fine detritus, and the lens contained numerous vesicular cells and Morgagnian globules. Differing from Abelsdorff, S. attributes these changes to a direct lesion of the lens by the radiation.

S. concludes, that Thorium X solutions cannot be used therapeutically on the eye, because we do not know how long Thorium X and how long its products of disintegration remain in the eye and because the solutions contain all kinds of rays, the therapeutically active gamma rays and the therapeutically inactive, even nocuous, alpha and beta rays, which cannot be separated in solutions.

C. Z.

FROZEN CARBON-DIOXIDE IN THE TREATMENT OF TRACHOMA, VERNAL CATARRH, AND PTERYGIUM.—PRINCE, A. E., Springfield, Ill. (*Arch. Ophthalm.*, May, 1916, XLV, 219), reports good results

following the use of frozen carbon-dioxide in the above diseases of the eye. He describes his method of obtaining the ice, method of anaesthesia, and technic of application. The author's results in trachoma were good, and he reports the extermination of the disease in one public institution. The snow is applied to affected areas for a period of two seconds. In cases of pterygium he removes the growth by operation, applies the ice, and repeats the application at end of two weeks. He also reports improvement following the use of carbon-dioxide ice in two cases of vernal conjunctivitis.

W. R. M.

REPORT OF A CASE OF MELANOSARCOMA OF THE ORBIT, TREATED WITH RADIUM.—HECKEL, EDW. B., Pittsburg (*Arch. Ophthalm.*, September, 1916, XLV, 465), reports a case of melanosaarcoma of the orbit in a man aged 48 years. The orbital growth followed an enucleation of the eye for a melanosaarcoma. Incision was made into the orbit and fifty-three milligrams of radium element, in a silver capsule and screened by lead and a rubber tube, was inserted and left for eleven and one-half hours. Eight months later there was slight recurrence and an application of fifty-three milligrams of radium was made for twelve hours. Six months later the orbit was curetted and one hundred milligrams of radium was inserted and left in place for fourteen hours. Ten months later there was no pain or discomfort in the orbit and no increase in the orbital contents. There was, however, an extensive involvement of the liver, spleen, and pleura.

The author believes that an electro-cautery knife could preferably be used to remove the mass from the orbit and then introduce one hundred milligrams of radium element and allow it to remain twelve hours.

W. R. M.

LOCAL ANAESTHETISERS.—MADDOX, ERNEST E., Bournemouth, England (*Ophthalmic Record*, March, 1917). Small discs lint-like on the one surface and with an impervious backing of thin rubber on the other surface. This backing should be just stiff enough to permit the easy introduction of the disc, though not needlessly hard. The warmth of the eyeball makes it a little softer almost at once. The strength of the anaesthetic is now exerted in one direction only. The discs are impregnated, before being cut, with 10% cocaine during their manufacture in bulk, and then allowed to dry. Reversed, can be used to anaesthetise ocular tendons before the operation of advancement. The impervious backing prevents the tears from

washing away the solution so quickly as they do from a mere pledget of cotton wool. Burroughs and Welcome make these discs.

C. I. H.

SILVOL.—WHITE, WILLIAM C., Louisville, Ky. (*Jour. Ophthal., Otol. and Laryngol.*, December, 1915). The author sums up the advantages of this preparation as follows:

1. Quick solubility in any solution necessary for application to the mucous membranes.
2. Less staining properties than other proteid silver preparations.
3. High per cent of silver content.
4. Minimum amount of irritation when applied to the mucous surfaces.
5. Low per cent solution necessary as compared to other similar preparations.

G. I. H.

MEDICAL SOCIOLOGY

THE SEATING OF CHILDREN IN OUR PUBLIC SCHOOLS AND ITS RELATION TO DEFECTIVE EYESIGHT.—SHAW, J. HOLBROOK, Plymouth, Mass. The author's conclusions are:

1. School life has been shown to have a harmful effect on eyesight.
2. School children are prone to work with their eyes too near the book or paper, a position which favors defective eyesight.
3. Modern school furniture properly adjusted, encourages a safe working distance, both directly by the position of the desk (not too far away nor too high) and indirectly by avoiding fatigue of the back muscles.
4. The placing of school furniture and its adjustment are vitally important in the conservation of eyesight and should always be under expert medical supervision.
5. The medical profession, oculists especially, should inform themselves as to the conditions under which school children work and demand proper seating.

M. B.

EYE INJURIES AS RELATED TO WORKMEN'S COMPENSATION.—GULLIVER, F. D., New York (*Med. Record*, Oct. 28, 1916). The writer draws attention to compensation for partial defects of vision; how various states regard partial defects of vision, and their basis for making awards for such defects, and makes a comparison of awards in the various states with those of the New York Industrial Commission.

The New York Commission rules that in a case where remaining vision of the injured eye is $1/3$ or less, the injured is entitled to compensation as for total loss; where the injured eye has vision of $2/3$ the normal, the claimant is entitled to compensation for $1/2$ the loss of the eye; in amounts of vision between $2/3$ and $1/3$ of the normal, the award is determined largely by the vocation or work of the injured.

The above awards apply to laborers, and those not requiring particularly good visual power. In cases of mechanics and those persons requiring good vision, the award may be increased at the discretion of the commission.

In Germany, Austria and in other states in this country the loss must equal or exceed $9/10$ to secure compensation for total loss. The writer contends that with $1/3$ remaining sight the field of vision and stereoscopic vision are not destroyed and compensation for total destruction of sight under such circumstances seems to him unfair; this view is taken in all jurisdictions other than in New York State. He believes that the general ruling giving total compensation where $1/10$ of vision remains, with practical loss of both field of vision and stereoscopic vision is far more equitable, and that it is unfair to one who has suffered total loss of an eye to receive no more compensation than one with $1/3$ of sight remaining.

He also criticises the award of $1/2$ the loss of an eye where the remaining vision is $2/3$, since the percentage of remaining vision can be ascertained; and he believes compensation should be given to the extent of the percentage of loss. He finds that in New York State the compensation for total and partial destruction of vision is greater than elsewhere.

C. H. M.

RE-EDUCATION OF BLIND SOLDIERS.—LAWSON, ARNOLD, London (*Report of Dec. Meeting, Med. Soc. London; Brit. Med. Jour.*, Dec. 16, 1916). The writer described what is being done in England for the blind and spoke of the different institutions including St. Dunstan's. A complete revolution in the training of the blind had been brought about by the war. Before, the inmates of institutions for the blind had chiefly been affected since infancy or were old people. The saving clause of the present situation was the youth and buoyancy of the patients. At St. Dunstan's there was an air of unforced cheerfulness. Self-pity was not permitted; they were taught to accept their lot as an inconvenience, not as a hopeless defect. This lesson was usually learnt in a short time. They

were also taught to regain their independence, and for this purpose, after some preliminary drilling, were left to themselves without guides or other helpers on whom they could come to depend. Precautions were, of course, taken to render this course a safe one. The natural suspicion of the blind man had to be overcome, and at first presented a difficulty. They were then given a routine training, first learning to read and write with Braille types. It was not easy for men to learn to read this type if their fingers had been rendered insensitive by their previous occupation, and type-writing proved easier. Next they were taught suitable handicrafts and trades. Physical fitness was assisted by Swedish exercises for those who could avail themselves of them, the instruction being given by a blind instructor, by rowing in the morning, and by walking, through the help of voluntary workers who took them out. Blind instructors also taught the various handicrafts, massage excepted. It had to be remembered that the blind tired more quickly than men with sight. After from seven to nine months' training the man was settled. This meant that a house was procured and he was set up in business, but he still needed supervision by the aftercare department so that mistakes in his work might be corrected and he might be protected from the unscrupulous.

C. H. M.

NEGLECTED EYES.—THE COST.—WOODWARD, JOHN F., Norfolk, Va. (*Jour. Ophthalm., Otol. and Laryngol.*, April, 1916). In two thousand cases from his records the author gives the grand totals of loss and inefficiency due to sheer neglect of the eyes.

Seven cases of total blindness with estimated value (vastly inadequate) of \$5,000 each equals \$35,000.

Ninety-two had useless vision in one eye. At \$3,000 each we get \$276,000.

Thirty-three had at least one-half reduction of usefulness, say \$1,500 each equals \$49,500.

One hundred and twelve were handicapped to at least 50 per cent, and as a laborer is supposed to earn at least \$1,200 a year, we have \$67,200 here.

This figures up \$427,700 loss. And this is a mere inkling into the real cost of bad eyesight. Think of the damage suits and court expenses brought about by bad eyesight—think of the loss in efficiency which, if it were put into dollars and cents, would be appalling out of a total of one hundred millions of people.

G. I. H.

THE FUTURE OPHTHALMOLOGIST.—MCCOOL, J. L., Portland, Ore. (*Jour. Ophthalm., Otol. and Laryngol.*, September, 1916). The specialist, whether he combines his work or limits it strictly to the eye, must prepare himself to do good refraction work, for only by so doing can he hope to merit the confidence of the general practitioner and the public. If he does not do this work gradually slipping away from him to the refracting optician who, however poorly prepared, at least tries to create the impression that he is qualified and competent.

G. I. H.

MISCELLANEOUS

INTRACRANIAL SURGERY AND ITS RELATIONS TO OPHTHALMOLOGY.—ELSBURG, CHARLES A., New York (*N. Y. State Jour. of Med.*, November, 1916). The writer points out that the present generally accepted view is that in the large majority of cases papilledema is due to a mechanical cause from the increased pressure of fluid in the vaginal sheath of the optic nerve, but that we do not know why papilledema occurs early in some varieties of expanding intracranial disease and is a late-comer in others, in which the intracranial pressure is just as high. Nor can we explain why in some cases large tumors will produce scarcely any changes in the fundi while others of small size are accompanied by marked choked disc; in many cases the amount of internal hydrocephalus influences the changes in the eye grounds; after removal of fluid by puncture of the ventricles the swelling of the discs will almost regularly diminish (though the diminution may be only temporary); what confuses this view, however, is the fact that some cases of internal hydrocephalus run their course without any change in the discs, or, if there is marked downward distension of the third ventricle, with primary optic atrophy.

Papilledema may reach a high grade very rapidly, and retinal hemorrhages may occur over night. It may subside with great rapidity; thus, four hours after an operation for meningeal hemorrhage a swelling of 2 D. in each eye subsided entirely and in another for mid-brain tumor the elevation was reduced from 6 D. to 1 D. twenty-four hours after operation.

As is well known, papilledema of a marked grade may exist for years without any subjective diminution in vision. If, however, vision once begins to fail, it will fail rapidly. One of the most frequent questions we have to answer before an operation for a brain tumor is: Will sight improve or not? The following has been the writer's experience: Papilledema of short duration even

when very advanced, and with marked diminution in visual acuity, may, after the appropriate operation, disappear entirely, and normal vision be regained. Sudden blindness from acute choking of the discs is, after the operation, usually entirely recovered from. Loss of vision from a long-standing papilledema is usually permanent. If sight has been lost it will rarely return; it is vain to hope that a quick operation will do any good. Some vision has been restored in a few patients who had a marked internal hydrocephalus associated with their new growth; in these, the restoration of sight followed the withdrawal or drainage of fluid from the ventricles. In most instances, if vision is lost for twenty-four hours from advanced choked discs, it is usually lost for good.

The writer expresses the hope that the time will come when choked discs will be considered a late and not an early symptom of brain tumors. Unfortunately at present patients are often first seen when choked disc is already marked. A study of cases of brain-tumor showed that 62 per cent sought aid only when they had marked papilledema; as a result operation often failed to save sight, there being much connective-tissue proliferation at the time of operation and subsequent contraction of this produced sufficient atrophy to destroy vision.

Examination of the records of 100 patients with brain-tumor showed that in less than 40 per cent the swelling of the disc was most marked on the side of the tumor. In about 60 per cent of patients with a new growth in one or the other frontal lobe the papilledema was most advanced on the side of the tumor, so that for the side localization of a frontal tumor this fact has importance. Studied from the standpoint of post-operative subsidence of the papilledema, it was found that in 84 per cent of the patients the choked disc on the same side as the tumor subsided much more rapidly, after the growth was removed, than that of the opposite side. If a decompression was done the papilledema subsided more rapidly on the side opposite to that of the tumor, unless the tumor was located on the same side as the decompressive operation. If a bilateral decompression was performed, then the eye contralateral to the side of the tumor improved more rapidly than its fellow.

The writer has carefully studied the effects of direct pressure upon the optic tracts and chiasm, whether due to pressure from a distended third ventricle, as occurs in internal hydrocephalus, to distant pressure as in frontal lobe tumors, or to direct pressure as in expanding lesions of the hypophysis and in the interpeduncular space; he agrees with Foster Kennedy that enlargement of

the blind spot is especially frequent in tumors of the frontal lobes, and that in a suspected frontal new growth a paracentral scotoma due to a blocking of the more sensitive macular fibres is of frequent occurrence. His experiences in hypophyseal disease are in accord with those of Cushing and Walker and if the visual fields are tested with small test objects instead of large one-centimeter ones, small quadrant defects in the temporal fields for form, and especially for color, will be frequently discovered.

Regarding the question as to whether sight can be regained in an eye that is blind from direct pressure on the chiasm or optic nerve when the pressure is removed; Elsberg considers the outlook for a return of vision better than in the case of blindness from papilledema; a return of vision is possible as long as the pupil will contract to light.

Finally, the writer points out that some brain-tumors attain considerable size without giving rise to headache; when the ophthalmologist examines such a patient and finds changes in the fields and papilledema he should not be misled and delay palliative or radical interference by the absence of headache. C. H. M.

A CASE OF BILATERAL MELANOSIS OF THE EYEBALL AND FACE.—KESTENBAUM, ALFRED (*From the eye clinic of Prof. F. Dimmer in the University of Wien. Zeitschrift f. Aug.*, 34, p. 317). A woman, aged 68, showed an almost exactly symmetric melanosis of the lids, root of the nose, parts of the cheeks and temples to the hair border, the zygomatic arches, and the forehead above the eyebrows, more intense on the left side, where it was blackish grey, than on the right side, which had an ash grey color, besides numerous small brown or grey round naevi in the face. The melanosis extended to the lid border, became more intense at the posterior edge, and on the left side spread into the conjunctiva. The left lower fornix contained three dark-brown folds in its whole length. The upper ocular conjunctive was opaque from brown pigment dots. Most striking was the discoloration of the left sclera, encircling the cornea as an almost closed ring, partly 1 cm., partly $\frac{1}{2}$ cm. wide. It was bluish almost like a staphyloma. Only at some places the intense brown color shone through. At the nasal and temporal sides the ring consisted of yellowish brown confluent spots. On the nasal side of the right cornea a larger number of brown spots was visible, on the temporal side the discoloration was slightly bluish. Upward a uniform blue area extended to the equator. No pigmentation could be noticed in the cornea.

The iris of both eyes was very dark brown, the left more than the right, and the fundus, especially the left, was intensely pigmented, but not the discs.

The hair of the patient was dark brunette. She stated that her father had dark brunette hair and her mother black hair, and both had very dark eyes. The excess of pigmentation seems to have been a consequence of summation of hereditary tendencies acting in the same sense. The incident literature is discussed. C. Z.

MUSCLES

PARALYTIC STRABISMUS: A SIMPLE AND ACCURATE METHOD OF DETERMINING THE AFFECTED MUSCLE.—RITCHIE, F. G., New York City (*Jour. Ophthal., Otol. and Laryngol.*, August, 1916). Under aphorisms the three of importance to his method are, "The image of the sound eye is always vertical," and "The vertical recti muscles govern the height of the cornea when the eye is turned outward and the inclination of the vertical meridian when the eye is turned inward" and "The obliques govern the height of the cornea when the eye is turned inward, and the inclination of the vertical meridian when the eye is turned outward." The next thing is to find out the kind of diplopia, where the false image is situated and what the inclination is.

Crossed Diplopia.—With images on the level indicates paralysis of an internus, the false image belonging to the affected eye. If in addition, there is a difference in the height of the images, one of the vertical recti muscles is affected. If the false image is higher, it is the superior rectus of the opposite side; if it is lower, it is the inferior rectus of the opposite side.

Homonymous Diplopia.—With images on a level indicates paralysis of an externus. If in addition there is a difference in their height, one of the oblique muscles is affected. If the false image is higher, it is the inferior oblique of the same side; if it is lower, it is the superior oblique of the same side.

A pre-existing manifest esophoria may cause an homonymous diplopia in a paralysis of a vertical rectus muscle, and a pre-existing manifest exophoria may cause a crossed diplopia in a paralysis of an oblique muscle. The inclination of the false image, however, will enable one to differentiate.

We do not understand how a pre-existing esophoria or exophoria could be determined unless the patient had been seen before the ocular paralysis occurred, furthermore we fail to see wherein this method is simple.

M. B.

MINERS NYSTAGMUS.—HOFFMAN, FREDERICK L. (*Ann. Ophthalm.*, July, 1916). This very elaborate treatment of this subject was copied by special permission from Bulletin No. 93, of the Bureau of Mines, Department of the Interior, U. S. A. It covers sixty-six pages and is a most comprehensive contribution on the subject. It deals largely with the literature on this subject, which has been contributed largely by English and German writers. This country has contributed so little that the assumption is that the disease is rare in the United States.

The Workmen's Compensation Act of England has made this disease of coal mines an important economic problem. The affliction occurs as frequently as from four to twenty cases to the 1,000 men employed. The safety lamp with its weak illumination is believed to have increased the frequency of the disease. Miners who use the pick while lying down are more frequently affected. Men who work during the day time and come out after dark are especially susceptible. Usually the victims are men who have worked for many years. Once afflicted they should stop work at once. The disease shows a marked tendency to recurrence if work is resumed too soon. It is generally regarded that the eye symptoms are only a part of the symptomatology of a general nervous disturbance. The reasons why the disease is rare in this country are that our coal formation is usually not in thin veins and that machinery is more extensively used and because of it the men are not required to use the pick in such strained positions. M. B.

MYOPIA

CAUSE AND TREATMENT OF STATIONARY MYOPIA.—KOSTER, W., Leiden (*Zeitschrift f. Aug.*, 34, p. 225), distinguishes high, progressive myopia, which he considers as a disease of the eye, from stationary myopia and propounds his views on the latter with the following conclusions: 1. The myopia occurring in eyes affected with maculae cornea, and especially the renewed progression of it under the influence of full correction, proves, that the strain of accommodation is the factor in the development of this anomaly of refraction. 2. In near work the external muscular pressure, or the too great convergence in peculiar structures of the skull, or the absolute or relative shortness of the optic nerve, can exert only a minor detrimental influence. 3. The overstrain of accommodation does not act through accommodative or post-accommodative increase of intraocular tension. 4. Precursors of stationary myopia are a slight decrease of the light sense and central vision with

dilatation of the pupil. Then follow venous hyperemia of the fundus and the development of a temporal crescent at the disc frequently already in still normal refraction. 5. The symptoms under 4 are produced by a benign chorioretinitis. 6. The stationary myopia does not primarily develop in consequence of a normal, though too long continued accommodation, but especially by an overstrain of accommodation by approaching the work too close to the eyes on account of diminished visual acuity and light sense. 7. The venous congestion of the posterior segment of the globe is caused by the excessive or too long prolonged traction of the ciliary muscle at the vortex veins, by which especially in the branches turning backwards the outflow is impeded by a kind of kinking. 8. In consequence of the venous stasis in the posterior segment of the eyeball the sclera at the posterior pole grows less resistant and gives way to the normal intraocular pressure. 9. The myopic crescent is not created by the ciliary muscle pulling on the chorioid, for then it would be at first visible at the nasal side of the disc. It is the expression of a process of retraction in the posterior half of the uvea. Only in latter stages of myopia it may become larger by too great distension of the sclera at the posterior pole. This retraction must be explained from the chronic stasis, especially in a chorioid already diseased. 10. The treatment of stationary myopia must as early as possible aim at curing the underlying chorio-retinitis. The radiation with radium and mesothorium seem to promise good results. Further the overstrain of accommodation must be combated, even by ordination of convex glasses for near work, where necessary. 11. The hypermetrope accommodates less intensely than candidates of myopia who work at close range. In hypermetropia no congenital weakness of the sclera exists which often promotes the development of myopia. 12. With the growth of the normal hypermetropic eye of the child the refraction of the lens constantly decreases considerably, which by the growth of the eye in the direction of the optic axis is constantly neutralized, while the increase of the size of the cornea, and a diminution of refraction, subsequent to it, is relatively very slight. 13. In hypermetropia also a venous congestion of the posterior segment of the eye from the influence of the excessive accommodation exists and in the same fashion as in the development of the stationary myopia acts in the sense of the prolongation of the ocular axis. By this every hypermetropic eye is led into the direction of emmetropia. If this is reached, the refraction becomes stationary, just as it happens in school myopia, if no further overstrain of

accommodation takes place. 14. If the chorioretinitis in stationary myopia is healed, which becomes apparent by better light sense and good vision, there is no reason to withhold from the patients full correction also for near work, but only under the condition that they read at one-third of a meter. For long continued work it is always better to prescribe weaker glasses. C. Z.

THE NON-OPERATIVE TREATMENT OF MYOPIA GRAVIS.—KOSTER, W., Leiden (*Zeitschrift f. Aug.*, 34, p. 215), sets forth his standpoint as to full correction of myopia. In his opinion full correction does not arrest the progression of myopia, but if full correction is tolerated by a patient, his case does not belong to the grave forms of myopia. The acceptance of full correction by a high myopic apparently depends upon the shape of his fundus, i. e., whether the whole surface of the fundus is more regularly ectatic or whether there is a large more local posterior staphyloma at the macular region. In the first case the retinal image of the outer world is after full correction sharply defined in a greater extent, in the second case the image at the macula is well defined, but not that on its surroundings, and, for looking around, this indirect vision is of much greater importance. In such cases the peripheral parts of the retina are by full correction overcorrected, so that the patient commences to accommodate, in order to neutralize the artificial hypermetropia. That this actually occurs transpires from the fact that he soon feels a marked accommodative asthenopia and that he sees the objects considerably smaller, for the retinal image is actually smaller than normally in accommodative correction of too strong glasses. Furthermore there is no doubt that myopia is unfavorably influenced by constant accommodation. Only if full correction prevents the patient from blinking and thus pressing his eyes by the lids, as this frequently happens in wearing weaker glasses, it can be regarded as a remedy.

In the treatment of grave myopia one must from the start remember, that it is not a simple error of refraction, but due to an insidious sclero-chorio-retinitis, the healing of which must be attempted, and as early as possible. For that purpose K. gives small doses of iodine and mercury preparations continued for years, viz., 14 days 0.5 iodide of potash, and 14 days from 0.025 to 0.050 hydrargyr. protojoduret., and so on, until marked improvement is noticeable. Near work is not forbidden, but strain of accommodation avoided. Full correction is given for the school, for the street no or weaker glasses which are also used at home for read-

ing, avoiding as much as possible convergence by doing near work at 25 cm. In some cases an atropin cure is instituted during the winter months.

The best results are promised by radiation therapy, which K. applies with radium bromide 0.004 or mesothorium in a glass globule at the end of a glass tube. With this the eyeball is stroked from the fornix of the lower and upper lids to the corneal limbus. It is disinfected in 5% carbolic acid or soap and alcohol. Each eye is exposed to the radiation in sittings of one hour with an interval of one week for five hours altogether. Sometimes it is followed by transient catarrhal secretion which must be treated. The lid border must not be exposed, as the skin does not bear radiation as well as the mucous membrane. The direct result of radiation is improvement of vision and healing of chorio-retinitis. K. uses radiation also in the stage of degeneration: intense opacities of the vitreous detachment of the retina, complicated cataract.

C. Z.

NERVOUS SYSTEM

NEUROLOGICAL ASPECTS OF SOME OPHTHALMOLOGICAL PROBLEMS.—WILSON, JOHN E., New York (*Jour. Ophthalm., Otol. and Laryngol.*, October, 1916). He first deals with the anatomy of the optic mechanism, and then goes into the pupillary reactions and the nervous mechanism of the external muscles of the eye. Localization of intracranial lesions from eye symptoms is well brought out. Disturbances of color perception and their significance are especially dwelt upon. Hallucination of vision when due to ocular disease may arise from errors of refraction, ocular defects, opacities of the dioptric media and changes in the choroid, retina and optic nerve, also from changes in the cerebral circulation and from organic disease of the cortical centers. Colored vision is generally due to absorption of pigments, which either change the dioptric media or produce some unknown change in the appreciative power of the retina.

M. B.

OPERATIONS

PREEQUATORIAL SCLERECTOMY IN DETACHMENT OF THE RETINA.—SCHIÖTZ, INGOLF (*Norsk Magazine for Laegevidenskab*, April, 1915, p. 459. *Abstract in Centralblatt f. pr. Aug.*, 40, p. 149), reports on the results of Holth's preequatorial sclerectomy in 21 cases of detachment of the retina, on dismissal: 5 improved, 9 unchanged, 6 deteriorated. After observation from $\frac{3}{4}$ to $2\frac{1}{2}$ years

after the operation 3 were improved (cured) 5 unchanged, 11 worse, 1 dead, 1 not traceable. In 2 out of the 3 cured cases the detachment had subsided, in the 3rd, according to a letter, V. was better, although still poor, but there was faculty of orientation, which was abolished before operation. C. Z.

THE OPERATIVE TREATMENT OF PARTIAL STAPHYLOMA OF THE CORNEA AND OF FISTULA OF THE CORNEA WITH A CONJUNCTIVAL FLAP, CONJUNCTIVO-KERATOPLASTY (KUHN).—KNAPP, ARNOLD, New York (*Arch. Ophthalm.*, July, 1916, XLV, 359), reports the following cases:

Case 1.—Partial corneal staphyloma; recurring attacks of glaucoma and iritis; excision of staphyloma; conjunctivo-keratoplasty. Result: The new scar subsequently became slightly ectatic and boggy and the increased tension returned.

Case 2.—Partial staphyloma of the cornea; repeated perforation after attacks of glaucoma; excision of staphylomatous part; iridectomy; release of adherent iris; conjunctivo-keratoplasty. Result: A perfectly flat and firm scar with no return of increased tension or irritation.

Case 3.—Corneal fistula; adherent leucoma; recurring attacks of glaucoma; iridectomy; curettage of the fistulous tract; conjunctivo-keratoplasty. Result: Fistula healed, tension normal.

The author adds that partial staphyloma of the cornea when complicated with glaucoma and attacks of iridocyclitis is one of the most difficult problems which confront the ophthalmic surgeon, and that the only method of treatment which offers some prospect of success consists in excision of the staphylomatous portion of the cornea, in release of the adherent iris with iridectomy, and in covering the defect with a double pedunculated conjunctival flap as recommended by Kuhn. W. R. M.

NEW OPERATION FOR CANTHOPLASTY WITH SPECIAL TECHNIC IN CASES DUE TO TRACHOMA.—WHITE, DANIEL W., and WHITE, PETER COPE, Tulsa, Oklahoma (*Ophthalmic Record*, March, 1917). The operation is described in detail and is profusely illustrated. Their technic is most thoroughly explained and should be read in by anyone that has a case of this nature to operate upon. G. I. H.

CHOICE OF METHODS IN THE REMOVAL OF THE EYEBALL.—FISHER, CARL, Rochester, Minn. (*Jour. Ophthalm., Otol. and Laryngol.*, January, 1916). The author believes that evisceration from its

simplicity and very superior cosmetic effect is the method to be preferred, save when tumor, infection, pain or sympathetic ophthalmitis indicate enucleation. If enucleation be performed, a glass ball inserted in Tenon's capsule is a procedure sufficiently reliable to have held its place among good operators and gives a good cosmetic result. Simple enucleation without suture gives an easy, quickly healing stump, which requires almost no care afterwards and is the operation of choice where these considerations are important and cosmetics are not, as well as under the pathologic conditions mentioned.

G. I. H.

OPTIC NERVE

"RENAL CHOKED DISC."—HARDY, WM. F., St. Louis, Mo. (*Am. Jour. of Ophth.*, December, 1916). The writer points out that practically all text-books employ the term optic neuritis, choked disc, papillitis and papilloedema interchangeably, and that a better nomenclature is needed; others have expressed the same thought. In like manner objection is made to the terms albuminuric retinitis, the prefix "albuminuric" being improper, and it would be better to say nephritic, renal or toxic retinitis, since albuminuria is but a symptom of nephritis and may or may not be present.

He is aware that criticism will be invited on account of aligning himself with those who definitely discriminate and distinguish between optic neuritis and choked disc; it is his belief that papilloedema is primarily a non-inflammatory condition and that if, histologically, there is found in the later stages an infiltration with round cells, this is consecutive and secondary and represents the result and not the cause of choked disc. The contentions embodied in this paper are made a prelude to the direct discussion of renal choked disc are; (1) That optic neuritis and choked disc are aetologically distinct entities; (2) that the assumption of a manifold pathogenesis of choked disc is probably incorrect; (3) that papilloedema is primarily of mechanical origin, all the concomitant phenomena being accountable for on that basis; (4) that the inability to always clinically distinguish between the two conditions does not necessarily imply a common origin or identical process; (5) that optic neuritis is primarily and essentially an inflammatory process and that choked disc is primarily and essentially an oedema and lymph stasis, the resultant of increased intracranial tension; (6) renal choked disc exemplifies both processes, each with its separate pathogenesis, showing a lymph stasis with oedema and also inflammatory changes.

The writer discusses the rationale of choked disc in general and interpretation by some as an evidence of increased intracranial pressure and by others as an inflammatory process. He gives many authoratative opinions supporting the former view and points out in addition: (1) Paton and Holmes in a microscopical study of fifty eyes from cases of tumor papilloedema concluded that the histological characters in any stage of the process are not inflammatory; on the other hand there may exist a true neuritis even eventuating in atrophy, in which there is ophthalmoscopically no appreciable oedema or swelling of the nerve head. (2) The atrophy following papilloedema does not necessarily imply an inflammatory process; according to Parsons it is a neuritic degeneration; and Cushing has definitely stated that choked disc is an oedematous swelling of the optic papilla and that the final round cell infiltration and atrophy are not the result of an inflammatory process as the term "optic neuritis" would indicate. (3) Often a choked disc has subsided completely in a few hours after palliative operation; this is not compatible with a theory of inflammation. (4) Optic neuritis, i. e., a true inflammation, results from something more than blood and lymph stasis; bacterial or toxic agencies must be at the bottom of most cases of true neuritis.

Hardy argues that blood and lymph stasis in the optic nerve no more constitute a neuritis than blood and lymph stasis in legs of a decompensated heart patient, constitute cellulitis; long continued irritation of the fluid of the oedema is expected to result in tissue changes. It is common to meet with descriptions and accounts, in which the terms optic neuritis and choked disc are used at random, or else to designate a mild or severe affection. The impression is frequently conveyed that a given cause operates to produce at one time an optic neuritis and at another time a choked disc. It is to be inferred from such statements that optic neuritis, papillitis, papilloedema and choked disc are synonymous terms for processes which differ only in degree. In view of the fact that microscopical examinations of true choked disc have shown it to be non-inflammatory, also that it can be produced almost at will experimentally by increasing intracranial pressure, and finally that reduction of tension by decompression will often result in a rapid flattening of the swollen disc in a short time, makes the identity of choked disc and optic neuritis improbable.

The writer quotes a number of authorities who make a distinction between choked disc and optic neuritis, among them Adam who gives the most essential points of difference as follows: (1)

The behavior of the vessels; in choked disc there is a considerable difference in the fullness of the veins and arteries—the veins are distended, the arteries contracted; while in optic neuritis the arteries are almost normal and the veins overfilled. (2) The elevation of the nerve head in choked disc is usually more than 3 D. above the retina while a papillitis seldom reaches such a height. (3) The behavior of vision: in optic neuritis the vision is usually much impaired at a very early stage (central scotoma), whereas in choked disc it may remain nearly or quite normal for a long time; in early tumor choked disc the optic nerves are subjected to a fluid pressure (except in unusual instances in which the tumor presses directly on the nerve and causes atrophy, not papilloedema); this fluid pressure is not great enough to block nerve impulses, consequently vision is not greatly impaired; compression of the nerve substance in any marked degree would produce a central scotoma, a rare finding in choked disc.

Finally the subject indicated in the title is discussed and the history of such a case together with a report of the macroscopical and microscopical examination of the eye by Alt. C. H. M.

STUDIES OF OPTIC NERVE ATROPHY IN ASSOCIATION WITH CHIASMAL LESIONS.—WALKER, CLIFFORD B., and CUSHING, HARVEY, Boston (*Arch. Ophthalm.*, September, 1916, XLV, 407). The authors refer to previous communications illustrating the stages in the development of hemianopsia when produced by the pressure of hypophyseal or parahypophyseal tumefactions against the chiasm. Their original view was that pressure against the chiasm with resulting distension was the chief element in producing the field defects, but further investigations have led them to believe that tension as well as pressure is an important factor. Eight cases are reported showing different degrees of degeneration of the optic nerve, varying from mild degeneration to states in which there were comparatively few histologically normal fibres remaining, and illustrate the occurrence and progress of atrophy in optic nerves following lesions affecting the chiasmal region.

From a study of their cases the authors conclude:

"1. Despite the so-called atrophic pallor of the discs in patients having visual-field defects resulting from lesions in the chiasmal regions, the histological examination of the nerves fails to show the expected degree of fiber degeneration unless the process has been of long duration.

"2. The atrophy in the tracts considerably antedates that in

the nerves, where the fibers may be preserved by their retinal ganglion cells for several years after complete functional blindness has occurred.

"3. Our cases serve to illustrate the fact that in the presence of chiasmal pressure of known long duration associated with sharply cut hemianopsias, even when to the ophthalmoscope the nerve shows the pallor of presumed atrophy, there may be no corresponding sharp delimitation of the areas of atrophy in the cross-sections of the nerve.

"4. This at first sight would appear to be an inconsistency, but our more accurate perimetric findings with graded discs show that, after all, the boundaries of the seeing areas are less sharply cut than we had previously supposed, and perhaps correspond after all with the diffuse picture in the nerves."

The article is illustrated and a bibliography is added.

W. R. M.

SOME EXPERIENCE WITH COLORED LENSES UNDER SUB-TROPICAL CONDITIONS.—WALTER, FRED J., Daytona, Fla. (*Ophthalmic Record*, March, 1917). The conclusion is that amber is not nearly as good a tint as some others (because it does not eliminate the ultra-violet rays well) and preference is given amethyst (which does not make the world look gloomy) and Crookes tints because they do not cut down the visual acuity and meet the other requirements.

G. I. H.

PATHOLOGY.

THE PHOTOGRAPHY OF MACROSCOPIC AND MICROSCOPIC EYE SPECIMENS.—ELLIOT, R. H., and MRS. R. H., London (*Report of November, 1916, Meeting of Royal Soc. Med., Sect. of Ophth., The Lancet*, Nov. 11, 1916). The object of the paper was to help those who desired to photograph macroscopic eye preparations, there being no available literature on the subject. The following points were regarded as of importance: 1. The photograph must be taken in water, without the intervention of glass or other similar material. 2. The source of light must be good and even. 3. The camera must be placed vertically above the object so as to avoid reflections. 4. The object of the photograph must be so placed that its image will occupy the center of the plate, and a method of adjustment should be available to secure this end with a minimum of inconvenience. 5. A simple arrangement is necessary to fix the eye in position during the whole period of exposure. 6. To save unnecessary retouching the object should be photographed

lying on a dark and uniform surface to obviate the background disturbing the attention of those viewing the picture. 7. Care should be exercised in the choice of a camera and exposure periods must be carefully studied. For the making of lantern slides the contact method was recommended, and attention was directed to the following points: Correct exposure; the preparation of plates for exposure; development and fixation of the slides; the drying of the plates; and the reduction, intensification, and varnishing of slides.

C. H. M.

ON THE EFFECT AND FATE OF DEPOSITS OF URATES IN THE EYE.

—Experimental contributions to the question of the connection of eye affections with uric acid diathesis and the influence of radium emanation.—WESSELY, K., Würzburg (*Arch. f. Aug.*, 81, p. 149). injected a sterile suspension of crystallic monosodic urate in physiological salt solution into the cornea, under the conjunctiva, and into the anterior chamber, of rabbits. The monosodic salt was used for maintaining the analogy to human pathology, as not only the gout tophi but also the uric acid circulating in the blood consist of it. Injections into the cornea, caused almost no irritation and the crystals were absorbed or cast off in a few days, leaving a tender scar merely corresponding to the puncture. Injection under the conjunctiva produced violent hyperemia and chemosis for a few days, with gradual absorption of the urate without leaving greater disturbances. Microscopically a dense infiltration with leukocytes remained for a long time in the focus and the surrounding tissues of conjunctiva and sclera, followed later on by necrotic changes.

In the majority of experiments the reaction after injection of from 0.5 to 1 cg. into the anterior chamber was comparatively slight. In some cases the aqueous was slightly opaque and the iris swollen, with a few posterior synechiae, which all disappeared after a few days. The opaque swelling of the corneal substance was attributed to the toxic action of sedimented urate at the posterior surface of the cornea. The opacity gradually disappeared under the development of blood vessels from the marginal loops.

Microscopically the deposit of urates is enveloped and permeated by conglua of fibrin, and there is an abundant immigration of leukocytes, and numerous eosinopriels. Giant cells are found from 7 to 14 days later. The endothelium of Descemet's membrane at the extreme sinus shows proliferation and participates in the formation of numerous stratified flat cells, almost completely filling

the space of Fontana. The parenchyma of the cornea is thickened to twice its size and infiltrated with leukocytes. After four weeks these macroscopic and microscopic changes disappear almost completely and a nearly normal condition remains for about a month. Then a gradually waxing opacity of the cornea develops in the area corresponding to the original site of the urates, due to necrotic processes. Decemet's membrane is separated into two lamellae, enclosing a coarse fibrillar new formed tissue. This vascular tissue is best characterized as pannus of the posterior surface of the cornea. In the third and fourth months minute glistening crystals develop in this tissue, which Wessely so far was not able to determine as urates, although he thinks they are urates.

The interesting and important feature of the experiments lies in this late sedimentation of crystals and the slow necrotic process due to the very gradual and chronic poisonous action. According to Wessely there is scarcely another explanation but that the noxious agent remains during the whole time in some form fixated in the tissue, and it may be supposed to play a constant role in the slowly developing changes. He believes that his experiments bring us nearer to the conception that even without local sedimentation of uric crystals merely dissolved monosodic urate circulating in the body may evolve toxic effects on certain tissues of the eye.

The second part deals with W.'s experiments on the influence of radium emanation on the deposits of urates in the eye and the peritoneum. From the macroscopic and microscopic findings he concludes that radium emanation even in high concentration, exceeding the usual clinical values, has no influence on the effect and the fate of urates deposited in the body.

C. Z.

TO THE TECHNIC OF EXAMINATION FOR EPITHELIAL INCLUSIONS OF THE CONJUNCTIVA (PROWAZEK'S CORPUSCLES).—STARGARDT, K. (*From the eye clinic of Prof. H. Kuhnt in the University of Bonn. Zeitschrift f. Aug.*, 34, p. 295). The occurrence of Prowazek's corpuscles in trachoma, inclusion conjunctivitis of the new born, epitheliosis desquamativa, and swimming bath conjunctivitis, is generally accepted, but in other affections of the conjunctiva only by some authors. S. thinks that the apparently positive findings of Prowazek's corpuscles in acute conjunctivitis, spring catarrh, etc., were due to faulty technic. In his opinion the examination of epithelium, not of secretion, is necessary for obtaining reliable results. For that purpose he recommends the following method:

1. Removal of fat from the slides by cleaning with 90 or 96% alcohol and holding them for a few seconds in the flame of a Bunsen burner.
2. Dropping a drop of physiological salt solution of the size of 3 mm. on the slide.
3. Obtaining the material with a platina scraper of Kuhnt.
4. Shaking off of the cells in the drop.
5. Spreading the drop with the scraper on the slide.
6. Drying in air.
7. Fixation in methyl alcohol for from 15 to 20 minutes.
9. Staining with freshly prepared Giemsa solution (1 drop in 1 ccm. of distilled water).
10. Irrigation by a strong stream of water.
11. Drying in air. The principle of it is to obtain a specimen of epithelial cells by keeping the cells as much as possible intact.

C. Z.

NEW OBSERVATIONS ON CORNEA AND RETINA OF THE EYE.—
HAAB, O., Zurich, Germany (*Ophthalmic Record*, March, 1917).
The corneal disease designated Buchstaben keratitis is a rare affection. Haab has discovered seven cases in the past eighteen years. For its observation a very intense lateral illumination is necessary. One sees superficially small and larger zones composed of short, straight, sometimes crossing one another, raised, linear cloudings of the epithelium. In arrangement they resemble straight letters, such as A W V or X. The larger lines may for a certain length be followed by a parallel double border. Scattered among them may be small round infiltrated zones, or a line may be interrupted by a group of these dots.

There is mild ciliary irritation. In one to three weeks the process may terminate, but a marked characteristic of this keratitis is the tendency to relapse. Reduction of intraocular tension may complicate and finally permanent clouding of the stroma and corneal surface may destroy the usefulness of the eye.

A case of lipemia in the Klinik of Eichhorst last summer gave me the positive proof that the blood color is a very minor factor in producing the red background as seen in the fundus, and that as proven by Marx in 1909 the pigment epithelium just back of the retina is alone responsible for the red to brownish tint.

Lately Haab has used the powerful electric Osram lamp, which is constructed according to the half Watt system. Its illuminating power is near that of actual sunlight, so that with it one can observe the reflexion of the so-called magic Japanese mirror. G. I. H.

PHYSIOLOGY

A RÉSUMÉ OF EXPERIMENTS ON THE EFFECT OF DIFFERENT CONDITIONS OF LIGHTING ON THE EYE.—FERREE, C. E., and RAND, G., Bryn Mawr College, Penn. (*Annals Ophthal.*, July, 1916). This paper gives a brief outline of five years' work, the object of which was to compare the effect of different lighting conditions on the eye and to find the factors in a lighting situation which cause the eye to lose in efficiency and to experience discomfort. The prominent effects of bad lighting systems are loss of efficiency and eye discomfort; the paper deals chiefly with the test for determining the power of the eye to sustain clear seeing. The following aspects of lighting sustain an important relation to the eye: The evenness of illumination, the diffuseness of light, the angle at which the light falls on the object viewed, the evenness of surface brightness, intensity, and quality, or color value of the light. The first four of these factors, are discussed briefly with reference to types of lighting now in common use.

The ideal condition with regard to the distribution factors, so far as the functional welfare of the eye is concerned, is to have the field of vision uniformly illuminated with light well diffused and no extremes of surface brightness. The proper illumination of a room by daylight gives the best control of the distribution factors. Of artificial system the best is the indirect system and the semi-indirect component of light. The former introduces no extremes of surface brightness in the field of view greater than that which the eye is prepared to stand without significant depression of functional power, and the bright spots are on the ceiling well removed from the zone of most harmful influence on the eye. The objections to the direct system are enumerated. The semi-indirect reflectors, a compromise between the direct and indirect systems, share in the respective merits and demerits of each in proportion to its place in the scale and especially according to the density of the reflector. But the tests showed that the concession is not nearly so great as it was supposed to be in case of reflectors of low or medium density; installed at the intensity of illumination ordinarily used or at an intensity great enough for all kinds of work, little advantage seems to be gained for the eye for reflectors of low and medium density; for with these intensities of light and densities of reflector the brightness of the source has not been sufficiently reduced to give much relief to the suffering eye. Moreover, the principles in accord with which the installation is made require that the reflector be brought further

into the field of vision than is the case, for example, when a direct reflector is used; on this account a worse result is apt to be obtained with semi-indirect reflectors of low and medium density than even with equally well designed direct reflectors of the same density.

Briefly, the following results were obtained as a result of the many tests made: (1) If the light is well distributed in the field of vision and diffuse, and there are no extremes of surface brightness, the tests indicate that the eye, so far as the problem of lighting is concerned, is practically independent of intensity. (2) For the control of distribution effects given by the semi-indirect reflectors of low and medium density and the direct reflectors presenting, as most of them do, excessive brilliancies due to opening, surface of reflector, or a wholly or partially exposed source, the results show unquestionably that too much light is being used in ordinary work for the comfort and welfare of the eye. (3) The angle at which the light falls on the object viewed is an important factor, but not nearly so important, for example, as evenness of surface brightness in the field of vision; extremes of brightness in the field of vision are very fatiguing to the eye. (4) Of the systems of artificial lighting tested thus far, the best results have been obtained for the indirect systems and the semi-indirect systems with reflectors having a high density; a great deal of loss of efficiency results from the use of semi-indirect reflectors of low and medium density, and from the use of direct reflectors, especially those of shallow and medium depth. (5) The problem of installing is not the same for the semi-indirect as for the totally indirect reflector; in the latter case the height should be so adjusted as to give as nearly as possible an even distribution of surface brightness on the ceiling and evenness of illumination on the working plane. (6) In the work of providing general illumination the most difficult feature presented in the problem of protecting the eye is encountered in the lighting of rooms of low and medium height. (7) The loss of efficiency sustained by the eye in an unfavorable lighting situation seems to be muscular, not retinal; the retina has been found to lose little, if any, more in efficiency under one than under another of the lighting systems employed (tested by power to discriminate color and brightness, lag of sensation, rate of exhaustion and rate of recovery). (8) Eye shades are apparently not an adequate substitute for lamp shades for the protection of the eye from the source of light; the best results were gotten by means of an opaque eye shade with a light lining;

the usual opaque eye shades with a dark lining, while they shield the eye from the source of light, do not by any means eliminate harmful brightness differences in the field of vision; they in fact create for the eye a very unnatural brightness relation, i. e., they make the whole upper half of the field of vision dark, in sharp contrast with the brightly lighted lower half. (9) The observation of motion pictures for two or more hours causes the eye to lose heavily in efficiency; the loss decreases rather regularly with the increase of distance from the projection screen. (10) In all the conditions tested a rather close correlation is found to obtain between the tendency of a given lighting condition to cause loss of visual efficiency and to produce ocular discomfort.

C. H. M.

REFRACTION AND ACCOMMODATION

HIGH HYPEROPIA FROM A CLINICIAN'S STANDPOINT.—HANSELL, HOWARD F., Philadelphia (*Annals of Ophth.*, October, 1916). The writer analyzes two hundred cases of hyperopia of three dioptries and higher for the purpose of learning why certain cases did not obtain full relief from asthenopia when the estimation of the refraction was accurately made. He concludes that the obstacles to the perfect relief of asthenopia most frequently encountered are deficiency of adjustability of the convergence to the altered stimulation to the ciliary muscles or association of accommodation; differences in the accommodation of the two eyes; the mental attitude of the patient toward glasses, or his oculist; ill health; and the imperfect work of the optician.

J. M. W.

WHY CORRECTIVE LENSES OFTEN FAIL TO GIVE RELIEF IN HEADACHES DUE TO EYE STRAIN.—O'CONNOR, RODERICK, Oakland (*The Journal of Ophthalmology and Oto-Laryngology*, November, 1916). The author is of the opinion that the eyes, as the cause of obscure headaches, can not be eliminated till we show the following:

1. Relief of accommodative strain by proper lenses and with them—(a) balance for near, (b) balance for distance.
2. Normal convergence.
3. The proper amount of reserve convergence and accommodation as compared with the distance at which the eyes are used for near.

G. I. H.

RETINA

A CASE OF SYPHILITIC RETINOCHOROIDITIS JUXTAPAPILLARIS, WITH MICROSCOPIC EXAMINATION.—VERHOEFF, F. H., Boston (*Arch. Ophthal.*, July, 1916, XLV, 352), describes a case of retinochoroiditis juxtapapillaris, Jensen's retinitis, occurring in a man aged 28 years, who, two months previously, had syphilis and was treated with neosalvarsan. At time of eye involvement, Wassermann was negative. Mercurial inunctions were used twice daily for 3 months and during this time the inflammatory condition of the eye increased, the eye became totally blind, and was removed. Pathological examination showed a granulomatous lesion near the margin of the disk, which involved the inner layers of the retina and secondarily the disk and chorioid. About 3 weeks after enucleation, secondary syphilitic manifestations developed.

The author believes it possible that some of the cases reported as Jensen's retinitis were syphilitic in origin. W. R. M.

ON A FEW RARE DISEASES OF THE RETINA.—ISCHREYT, G., Libau, Courland (*Arch. f. Aug.*, 81, p. 168). 1. A case of von Hippel's disease in a man, aged 42, observed for 9 months. The retinal glious or gliomations new formation produced a sudden impediment in the arterial current, with subsequent arterial hyperemia and edema. At this moment the patient noticed dark spots before his eye, on account of which he came to I. After the blood current was regulated by compensatory arteriitis, the secondary disturbances gradually subsided. That this improvement was not lasting was shown by the occurrence of recent opacities of the vitreous. The intense ectasia of the vein was not explained, perhaps it was due to thrombosis of the papillary end, connected with the gradually developing optic neuritis. 15 of the so far described 23 cases occurred in men at the average age of 21.

Case 2. Peculiar, probably senile, affection of the macula in a woman, aged 74. V. R. fingers at 40 cm. V. L. fingers 6.5 cm. The macula of the left eye was encircled by a ring-shaped detachment of the retina. This zone perhaps corresponds to the marginal net of the retinal vessels. The larger ophthalmoscopically visible blood vessels apparently did not transgress this area. The chorioidal vessels showed distinct sclerosis and the pigment epithelium was atrophic. It could not be determined without anatomical examination, whether the retina was totally detached at this area or whether it was a cystic detachment of certain layers, in concordance with

the investigations of Zeemann's, which showed a predilection of the perifoveal zone through its peculiar vascularization to the formation of cysts. Thin exudations probably are the causes of the changes in both cases.

Case 3. Retinitis in form of an arc in a woman, aged 60. V. R. 1/50 V. L. 1/100. About 2 disc diameters above the right disc, a grey opacity commences, at first following the blood vessels and then turning downward concentrically to the macula. It shows shadows suggesting folds. The upper temporal artery is tortuous according to the unevenness of the opacity. The vein passes smoothly on it. At an indentation of the upper portion a few whitish foci were lying under a small artery. At the macula was an indistinct grey round focus with fine radial vessels around its periphery.

The left eye showed similar changes. The folds of the retina were apparently due to exudative processes in the retinal tissue and the subretinal space. The changes seemed to be of older date and were considered as a kind of exudative retinitis (Coats), with some deviations. The foci at the macula may have been senile. The seam of blood at the macular patch in the right eye made the previous occurrence of hemorrhages in the exterior layers of the retina and the subretinal space probable.

Case 4. A man, aged 29, V. R. 1/8 V. 1/13. Had lues, although the serological examination was negative. The left eye became affected 5 months, the right 1 month ago. The process consisted in retinal arteriitis and periarteriitis which by leading to obliteration of the vessels and formation of connective tissue in the vitreous had the character of retinitis proliferans. The arc-like figure surrounded not the macula but a small pigment focus at the nasal side. The retina was the chief seat of the disease, while the chorioid showed only a change on one place. There were posterior synechiae, pigment deposits on the anterior capsule and diffuse opacities of the vitreous. The etiology was almost certainly lues and the recent visual disturbance may have been due to degenerative maculitis.

C. Z.

ON THE SPONTANEOUS CURABILITY OF DETACHMENT OF THE RETINA AND THE VALUE OF ITS TREATMENT.—HOLTH, S. (*Norsk Magazine for Laegevidenskab*, June, 1916, p. 754. *Abstract in Centralbl. f. prakt. Aug.*, 40, p. 146), asserts that spontaneous curability of detachment of the retina is so rare, that it does not play a rôle in the estimation of the results of operation. He attained

by his preequatorial sclerectomy three permanent recoveries in seven cases without visible ruptures of the retina, no result in 11 cases with rupture. He therefore considers a rupture of great importance for the prognosis of the operation. C. Z.

PROGRESSIVE MACULAR DEGENERATION IN THREE MEMBERS OF A FAMILY. — FEINGOLD, MARCUS, New Orleans, La. (*Arch. Ophthal.*, November, 1916, XLV, 533), reports three cases of progressive macular degeneration occurring in a Jewish family. Clinical history of the cases are given, reference made to the literature, and a bibliography is appended. The article is illustrated.

W. R. M.

SINUSES. NOSE AND EAR.

OTOGENOUS INTRACRANIAL COMPLICATIONS WITH OPTIC NEURITIS, WHICH HEALED WITHOUT INTRACRANIAL OPERATION.—MYGIND, H. (*Ugeskrift for Laeger*, 1915, p. 1286. *Abstract in Centralbl. f. pr. Aug.*, 40, p. 148), reports on 4 cases of purulent otitis media with partial affection of the labyrinth, complicated with optic neuritis. In all indefinite signs of intracranial complications (headache, vertigo, vomiting, etc.), were found, but they recovered without operation. M. thinks with Koerner, that especially the cases of diffuse, purulent otogenous meningitis with favorable course are accompanied by optic neuritis. C. Z.

SYMPATHETIC OPHTHALMITIS

IS SYMPATHETIC OPHTHALMIA AN ANAPHYLACTIC INFLAMMATION?—SCHIECK, F., Halle, A. S. (*Zeitschrift f. Aug.*, 34, p. 245), discusses, whether the anaphylactic theory of sympathetic ophthalmia propounded by Elschnig, is at all clinically applicable or meets with important objections, so that it must be repudiated. Elschnig advanced the hypothesis, that sympathetic ophthalmia is an expression of local anaphylaxis, utilizing Bail's theory. Bails' theory says that by antigenous resorption of injured uveal tissue an over-sensitiveness is produced in the organism, especially the homologous organ, viz. the 2nd eye. As in Pirquets' experiments inflammations occur in consequence of increased capability of reaction through introduction of the anaphylactogen from outside, in our case an inflammation would have to arise, with the serious sequelae, due to the vulnerability of the organ, by the least disturbance in the over-sensitive eye, by the disintegration of even one uveal cell or pigment epithelium. Schieck points out, that for applying

this assumption to the clinical facts it must be proven: 1. That the uvea contains an organ-specific, anaphylactogenous albumen, which is absorbed as antigen; 2, whether an organism produces anti-bodies against its own, although serum-heterogenous, albumen, and whether it can be sensitized against its own products, in other words whether an auto-anaphylaxis exists; 3, how a spontaneous disintegration of uveal cells occurs in the second eye and how the introduction of the anaphylactogen takes place locally; 4, the main point is that the clinical facts must be brought in accord with the essence of anaphylaxis.

Leaving the 3 first points aside, S. considers the course and peculiarities of the disease as such and whether they fit into the established scheme of anaphylaxis. He emphasizes that the protective effect of enucleation has not been sufficiently considered in judging the validity of the anaphylactic theory. Zade showed experimentally that the anaphylactogen from the eye after injection of the antigen into the anterior chamber is communicated to the whole organism after 3 hours. Perhaps the sensibilization of the body occurs even earlier. What good then, S. asks, can the removal of the injured eye do, if in the mean time uveal pigment, in a form acting as antigen, has entered the circulation, and the process of sensibilization takes place outside of the eye in the vascular system or the bone marrow, and, at the latest 14 days afterwards, the organism contains the dreaded anaphylactogenous anti-bodies against uveal pigment, and the least anomaly in the other eye may elicit the reactive process? If sympathetic ophthalmia were a process of anaphylactic reaction, all our prophylaxis would be in vain and the other eye even after preventive enucleation of the injured eye would be endangered for weeks, occasionally for years or for the whole life. Since fortunately this is not the case, sympathetic ophthalmia can have nothing to do with a sensibilization against uveal pigment, and the theory must fall. The certain protective effect of enucleation is not conceivable if the anaphylactic theory is accepted. In that respect bilateral idiopathic iritis and par-enchymatous keratitis, which as a rule also occurs in both eyes, are genetically entirely different from sympathetic ophthalmia.

C. Z.

OCULAR ANAPHYLAXIS. II. A CONTRIBUTION TO THE ANAPHYLACTIC THEORY OF SYMPATHETIC OPHTHALMIA.—WOODS, ALAN C., Philadelphia (*Arch. Ophthal.*, January, 1917, XLVI, 8), refers to the mycotic theory, as to the pathogenesis of sympathetic ophthalmia, advocated by Roemer and Fuchs, to the cytotoxic

theory of Golowin, and to the theory of Elschnig, who assumed sympathetic ophthalmia to be an anaphylactic uveitis.

In order to determine the fundamental points of the anaphylactic theory, the author endeavored to determine the following points:

1. The antigenic properties of homologous uvea-organ specificity.

2. The ability of one eye to react to perfusion in animals previously sensitized by intraocular injection of the other eye..

3. What constituent of the uveal tract is responsible for such antigenic properties as are possessed by homologous uvea. Technic of his experiments is given and a summary of his results. He concludes as follows: 1. Homologous uvea has the power of acting as antigen and producing an ocular hypersensitiveness. 2. Homologous uvea possesses a strong specificity. 3. Intraocular injection of a small amount of either homologous or heterologous uveal emulsion can produce a hypersensitiveness in the second eye. 4. From the evidence at hand, it seems probable that the peculiar antigen properties of uveal emulsion are due to the pigment epithelium. A bibliography is added.

W. R. M.

TEETH

ON THE DENTAL ORIGIN OF CERTAIN OCULAR DISEASES.—IBERSHOFF, A. E., Cleveland, Ohio (*Jour. Ophthal. Otol. and Laryngol*, Oct., 1916). His observations on this subject during the past two years have led him to conclude that the importance of oral infections in the causation of ocular disease has never been fully recognized or sufficiently emphasized. Especially in certain insidious, chronic, resistant and more or less masked morbid processes of the inner ocular structure will the cause and cure often be found to be a carious tooth or infected root canal. He has been so impressed with his observations that he now includes an inspection of the oral cavity in the routine of every ocular examination. A goodly percentage of such patients are promptly referred to the dentist for work which is essentially prophylactic, while in others it constitutes practically the only treatment prescribed. The majority of his cases can be classed under the same uveitis, more definitely as sub-acute and chronic serous cyclitis with formation of exudates on the posterior layer of the cornea, in the aqueous and vitreous. These cases have almost without exception been of long standing, mild in character, devoid of pain or other manifestations associated with acute inflammatory processes and have involved the iris but little or not at all. The chorioid, retina and optic nerve also showed fewer

anatomical changes than might be expected. Vision was in all cases seriously interfered with, principally by reason of the presence of exudates in the form of dots or pigment granules on the cornea, shreds or larger masses either freely movable or attached to the lens capsule, or finally in the vitreous. Only two of the eleven cases he reports showed any symptoms of external disease, and in both of these the lesions were those of phlyctenular keratitis. With the exception of a single case of lenticular opacity, all of the eleven cases reported responded with a marked improvement in vision varying from one-half to full normal. M. B.

TOXICOLOGY

STUDIES ON THE ACTION OF TOXINS AND PROTEIN DEGENERATION PRODUCTS ON THE EYE.—WOODS, ALAN C., Philadelphia, and STODDARD, JAMES L., Boston (*Arch. Ophthalm.*, July 1916, XLV, 321). The authors conclude, from a series of animal experiments, as follows:

1. A soluble toxin can be extracted from the bodies of virulent staphylococci and streptococci that is capable of producing an iritis when introduced into the anterior chambers of rabbits.
2. This toxin circulating in the blood stream in moderate doses is incapable of causing iritis in rabbits.
3. The "crude protein poison" of Vaughan can cause an iritis by injection into the anterior chamber.
4. Highly toxic anaphylatoxin is practically inert when injected into the anterior chamber.
5. Crude protein poison and anaphylatoxin circulating in the blood stream in as high concentration as is compatible with life, cannot cause an ocular inflammation, even when the research animals show all other signs of a grave intoxication.

A bibliography is added.

W. R. M.

REPORT OF CASES OF QUININE 'AMBLYOPIA' WITH REMARKS.—WEEK, JOHN E., New York (*Arch. Ophthalm.*, July, 1916, XLV, 342), reports three cases of quinine amblyopia, and discusses the pathological conditions present in each case. He states that the indications for treatment are first to relieve and prevent vascular contraction and such remedies as will do this should be employed.

The article is illustrated.

W. R. M.

RETROBULBAR NEURITIS WITH CENTRAL SCOTOMA FROM TOXIC ACTION OF THYROIDIN.—STANDISH MYLES, Boston (*Arch. Ophthalm.*, Sept., 1916, XLV, 469), reports three cases of retrobulbar

neuritis with diminished vision and central scotoma due to the administration of thyroidin. Discontinuance of the drug was followed by recovery of vision. In one of the cases the patient had been taking an unknown amount of the drug for only three days. The author adds that thyroidin should not be used indiscriminately and that the selling of proprietary medicines containing it is a dangerous practice.

W. R. M.

STUDIES ON THE ACTIONS OF TOXINS AND PROTEIN DEGENERATION PRODUCTS ON THE EYE.—WOODS, ALAN C., Philadelphia (*Arch. Ophthal.*, Sept., 1916, XLV, 451), repeated the experiments of Guillery (*Archiv. f. Augenheilkunde*, 1911, LXVIII, 242) and injected into rabbits sterile cultures of *B. prodigiosus* to determine its toxic action on ocular structures. As a result of his experiment he found that poisons can be isolated from non-pathogenic ferment-producing bacteria, which have a definite action upon the uveal tract in the eye. The ocular symptoms consist of a pericorneal injection coming on within forty minutes to two hours after intravenous injection, followed, when the toxicity of the solution is great, by an injection of the vessels of the iris, sluggish or inactive iris, slightly irregular pupil, and occasionally slight clouding of the cornea. Histologically, the eyes show a round-cell infiltration of the ciliary body and chorioid, small hemorrhages in the ciliary body, and a slight oedematous iris, with occasional posterior fibrinous synechiae.

The author concludes as follows:

"1. An uveal poison can be obtained from cultures of *B. prodigiosus*, and probably from similar ferment-producing organisms.

"2. This poison is not due directly to ferment activity, but to a degeneration product formed from the bacterial body and the protein of the culture media by the proteolytic action of the bacterial ferments. The poison comes under the class of ptomaines.

"3. Intravenous injection of this poison gives clinical symptoms and histological lesions of a chronic infiltrative uveitis.

"4. The poison is generally toxic to the animal, producing uneasiness, slight dyspnoea, diarrhea, and prostration.

"5. The ocular reactions observed following the intravenous injection of the poison are directly proportional to the general symptoms produced in the animal."

W. R. M.

OCULAR DISTURBANCES DUE TO MALARIA AND QUININE.—FERNANDEZ, JUAN SANTOS, Havana, Cuba (*Ophthal. Record*, March, 1917). Ocular disturbances due to malaria are rare now outside of

those places in which it still exists, and even then are no more frequent than other eye affections. The diseases more frequently seen are neuralgia of the fifth cranial nerve, iritis, optic neuritis and hemorrhages of the retina.

G. I. H.

TUMORS

INTRADURAL TUMOR OF THE OPTIC NERVE.—ELLETT, E. C., Memphis, Tenn. (*Annals Ophthal.*, July, 1916). Negro girl, aged 3. The family history was negative. The condition was of a few months duration, of gradual onset and without apparent cause. The eye was proptosed twenty-one millimeters, and turned a little downward. Vertical motion was lost. The eye was blind. There were no fundus changes. Nothing could be felt in the orbit by palpation. The eye was enucleated and the nerve divided at its entrance into the foramen. The entire excised portion of the nerve was enlarged, it being three centimeters in length by one-half centimeter in thickness. It was hardened in formalin and embedded in paraffin and cut. Dr. H. T. Brooks reported it to be glioma or gliosis of the optic nerve. The end results are not reported.

M. B.

EPIBULBAR SARCOMA.—HECKEL, EDWARD B., Pittsburgh (*Ann. Ophthal.*, July, 1916) reports a case with a new technic for use and treatment with Roentgen Ray. Patient was treated in 1910 and remains free from recurrence. He believes that malignancy about the eyeball or its adnexia should be treated without the knife. The use of the X-ray he has tried with the old technic without results. The case presented was in a man 69 years old. The tumor occurred on the temporal side of the eyeball and was removed by excision by another oculist, but it promptly recurred. A piece was excised and examined by Dr. Proescher, who pronounced it a spindle celled sarcoma. It was decided to expose the eye to the X-ray in the following manner. The author's fingers were used to expose the eyeball and normal salt solution was constantly dropped upon the cornea during the application of the X-ray. The Roentgen Ray was applied by Dr. George C. Johnston by means of a lead glass tube with a small flint glass window inserted in the wall, over which was fitted a speculum of lead glass terminating in an orifice of about one-half inch in diameter. The tube was so placed that the orifice of the speculum was within a centimeter or less of the neoplasm. The tube used was one capable of maintaining a vacuum during treatment, which permitted the passage of a current of three-quarters to one milliampere. The length of the exposures were from three to six minutes, and were applied three times a week for

four months and then once a week for two months, when the eyeball presented a perfectly normal appearance and functionally normal. Two months later a small nodule formed at the sclero-corneal junction. The Ray was again resorted to for two months with complete disappearance of the nodule, since which time there has been no recurrence. There is no doubt in the author's mind that the constant dropping of normal salt solution upon the exposed eyeball is responsible for the good results obtained. M. B.

ANGIOMA OF THE CHORIOID.—HAGEN, SIGURD (*Norsk Magazine for Laegevidenskab* (Norw.), July, 1915, p. 883; Abstract in *Centralblatt f. Prakt., Aug., 40*, p. 146), noticed at the posterior pole of the right eye of a girl, aged 17, with extensive angiomas of the skin of the eyelids and face, a tumorlike whitish green prominence. Tension was increased and the eye practically blind from early youth. A sclero-iridectomy was followed by an intraocular hemorrhage, and the eye enucleated after two weeks. The microscopical examination revealed an angioma of the chorioid. The left eye was in an advanced stage of glaucoma simplex. C. Z.

A CASE OF MELANOSARCOMA OF THE CHORIOID IN A PATIENT WHO HAD BEEN OPERATED ON SEVEN YEARS PREVIOUSLY FOR CANCER OF THE BREAST.—BENTZEN, C. F. (*Hospitalstidende*, 1915, p. 276, Abstract in *Centralbl. f. prakt., Aug., 40*, p. 145), found in the patient, who had been operated on for cancer of the breast seven years ago a central detachment of the retina with central scotoma of from 10-20°. Examination with Hertzell's diaphanoscope was doubtful. Since the scotoma grew, the eye was enucleated, showing a melanosarcoma of the chorioid 12 mm. in extent. C. Z.

A HARD FIBROMA OF THE CONJUNCTIVA.—DENZER, G. (From the eye clinic of Prof. E. Kruckmann in the University of Berlin. *Zeitschrift f. Aug., 34*, p. 311). An otherwise healthy man, aged 20, presented a hard bluish red tumor of the size of a cherry in the subconjunctival tissue of the lower segment of his right eyeball. The conjunctiva was injected and freely movable over the tumor, and the tumor itself was easily movable upon the sclera, with which it was connected by loose connective tissue. It had a broad base and was easily enucleated. Only at some place the base was attached to the sclera by tough fibrous strands of the aspect of tendinous or scleral fibers, which had to be cut with scissors. The conjunctival wound was closed by three sutures, and healed in a few days.

Histologically the tumor had the structure of a hard fibroma. It consisted of interlaced fibrillae, blood vessels, and two kinds of cells: round cells of equal size with round nuclei, scattered all over, and spindle cells with long processes and several nuclei between the fibrillae, but the number of the cells to that of the fibrillae was small. There were also larger spaces, empty or filled with red blood corpuscles; the walls of the latter consisted of a single layer of endothelium. There were no elastic fibers.

Literature contains eight cases, all occurring in men between the ages of 18 to 25, excepting one aged 58, which are quoted. In all the tumor was pedunculated. In this respect the present case was different, and also in the fact that it had a tough capsule of connective tissue, while the others showed a lining of proliferated conjunctiva or flat epithelial cells.

C. Z.

A CASE OF PAPILLOMA OF THE CONJUNCTIVA AND CORNEA WITH CONTACT TUMOR OF THE BORDER OF THE LID.—BIRCH-HIRSCHFELD, A., Koenigsberg (*Zeitschrift f. Aug.*, 34, p. 291). A man, aged 29, who stated that he had been under treatment for years on account of trachoma, of which some tender scars in the conjunctiva of the upper lid and a cicatricial band in the upper retrotarsal fold of the right eye were left, presented chronic conjunctivitis. The palpebral fissure was smaller. A flat triangular red, slightly nodular, tumor, 12 mm. in diameter, occupied the nasal sector of the ocular conjunctiva and cornea, covering the lower third of the latter, with a process extending to the lower limbus. From the base vessels extended to the surface, appearing as red dots, and numerous conjunctival blood vessels radiated into the tumor. At the region of the lower canaliculus, at the intermarginal border exactly where it touched the apex of the tumor, another tumor of the size of a lentil and the form and aspect of an acuminate condyloma was noticed. A few small tumors lay flat in the upper portion of the ocular conjunctiva, movable with this. One of these was excised and showed the typical structure of papilloma. An epithelial layer consisting of from 10 to 20 rows of cells was grouped around islets and cones of connective tissue with numerous well filled blood vessels. The cells near the connective tissue were cylindrical and towards the surface became cubic and then flat. In the basal strata numerous mitoses were found and in the intermediate portions scattered degenerated epithelial cells, analogous to those described by Contino. There was no destructive growth of the epithelium nor an ulceration of the surface.

The tumor was easily removed from the cornea, and the defect of the conjunctiva was covered by sliding flaps with prompt recovery. V rose from 6/60 to 6/30, and there was no relapse after six weeks.

The tumor most likely arose from the limbus, where it had the largest dimensions. The multiple occurrence of papillomas of the conjunctiva is common and is considered as a differential diagnostic sign from carcinoma. On account of its tendency pedunculated flaps, as the heavier pedunculated flaps may lead to insufficiency of the levator and ptosis. Otherwise he considers both methods as equivalent. In 103 cases he used pedunculated, in 119 cases non-pedunculated flaps. In his last 50 blepharoplastics with pedunculated flaps he had two failures and two half results; in his last 50 blepharoplastics with non-pedunculated flaps two failures, and four half results.

C. Z.

PRIMARY SARCOMA OF THE SCLERO-CORNEAL JUNCTURE TREATED WITH JEQUIRITY.—RAIA. V. L., *Providence, R. I. (Journ. Ophthalm. and Oto-Laryngology, Oct., 1916)*. Patient, a man, 40 years of age. Pathological diagnosis: spindle cell sarcoma. Three years of complete absence of suspicious symptoms after the application of jequirity in the present case induces the author to think that the cure is permanent.

According to Rampoldi, jequirity has an elective necrobiotic action on the cells of the neoplasm, while at the same time it stimulates the elements of the normal tissues around to a new and powerful activity by which the loss of substance is replaced. G. I. H.

REPORT OF THE REMOVAL OF A TUMOR AT THE APEX OF THE ORBIT, WITH PRESERVATION OF THE EYEBALL, IN A CASE OF PLEXIFORM NEUROMA OF THE EYELID, MICROSCOPICAL EXAMINATION.—KNAPP, ARNOLD, New York (*Arch. Ophthalm., Sept., 1916, XLV, 475*), gives the clinical history of a case of plexiform neuroma in a patient aged 17 years. The onset of the tumor in the upper lid dated from an injury at the age of nine months. The eye was proptosed and a Krönlein operation was done. A tumor was found enclosed in a capsule and adherent to the sheath of the optic nerve. Microscopically it showed the structure of a neurofibroma at the apex of the orbit and a plexiform neuroma of the eyelid.

The article is illustrated.

W. R. M.

UVEA

DIAGNOSIS OF UVEITIS.—MAXWELL, G. (*Dublin Jour. Med. Sc.*, v. 142, pp. 94, 158), briefly surveys such methods of diagnosis employed in clinical and scientific investigations on inflammations of the uveal tract as he has been able to find in literature, and describes his own work on the subject during the last year. He produced local infections by intraocular, and general infections by intravenous, injections of rabbits with bacillus coli, of tuberculosis, diphtheria and typhoid, staphylococcus aureus, and spirochete pallida. In the first series of his experiments he aimed at the detection of amboceptor in the aqueous humor, in the second, at discovering the presence or absence of its local production. His experiments demonstrate the formation of an amboceptor, produced in response to an intraocular infection, to be mainly due to general cellular activity; that, therefore, in the majority of cases of uveitis the examination of the aq. h. by the "fixation complement" method has no practical diagnostic value not also possessed by a similar examination of the blood. These experiments indicate in cases of an intraocular inflammation co-existing with some other infection elsewhere, a relative, and in some instances an absolute, preponderance in the infected aqueous humour of the amboceptor produced in response to the ocular infection. Further investigations are essential before this knowledge can be practically utilized. Researches on the formation of an amboceptor in chronic inflammations are necessary before we can argue that these conditions, indicated in acute uveitis, are in any way similar to those existing in chronic uveitis. The "fixation complement" method as a practical aid to diagnosis in general deserves far greater attention than it receives at present. The variability of the presence of amboceptor is one of the chief drawbacks to its more universal application. Further researches will undoubtedly throw much light upon this problem.

C. Z.

VISUAL FIELD

THE BLIND SPOT IN ITS RELATION TO THE SPACE VALUES OF THE RETINA.—LOHMANN, W. (From the eye clinic of Prof. C. von Hess in the University of Munchen, *Arch. f. Aug.*, 81, p. 183). A number of physiologists assume the presence of the blind spot also in the psychical visual field and base this on the possibility of its entoptic perception. L., in a critical investigation, with experiments of his own, discusses how far this assumption can be maintained, with consideration of some new researches which aim to

prove a shrinking of the visual field. He concludes that for the assumption of defect and shrinking of the psychical visual field a full proof has not been furnished, which would be able to eliminate the view of a defect of the blind spot also in the psychical visual field.

L. propounds the relations of the space values of the retina to the point of fixation and to the blind spot and how the former, displacing the latter, arise from these, leaving the traces of another arrangement. The deformations of straight lines at the blind spot are attributed to the peculiarities of the space values at the posterior pole of the eyeball. It is also shown that other facts of anatomy and physiology can be brought under a uniform conception by the special kind of arrangement of the space values. C. Z.

THE BLIND SPOT (Second Communication)—GRADLE, HENRY S., Chicago (*Annals of Ophth.*, Oct., 1916). The discussion is limited to the normal blind spot for black and white and its variation. The author makes a brief reference to the work of several investigators in this field. He describes his apparatus for the delineation of the blind spot in the following words: "A table about one meter long, on one end an adjustable chin rest; thirty centimeters from this, an upright black rod, two millimeters in diameter, with a slightly larger rounded top, the rod being moved laterally across the table in a groove and being extensible vertically; sixty centimeters from this chin rest a dull-white, round celluloid screen, fifty centimeters in diameter—this is clamped against a ring composed of wound wire connected with the lighting circuit, forming a solenoid; attached to both sides of the bottom of the solenoid are jointed arms bearing steel pencils, one centimeter thick and three centimeters long, the tip resting against the posterior surface of the screen; the posterior surface of the screen is marked by cross lines, one centimeter apart, the vertical ones being numbered and the horizontal ones lettered; at the patient's end of the table is a push button connected with a small electric lamp located behind and below the screen." The writer gives the following statistics of the composite normal blind spot measured with his instrument at sixty centimeters distant:

1. The exact center lies 17.13 centimeters from the point of fixation—16 degrees, 33 minutes, 32 seconds.
2. The internal border lies 14.13 centimeters from the point of fixation—13 degrees, 15 minutes, 35 seconds.
3. The external border lies 19.68 centimeters from the point of fixation—18 degrees, 9 minutes, 35 seconds.

4. Thus the horizontal diameter of the Blind Spot measures 5.55 centimeters, or 4 degrees, 54 minutes.

5. The uppermost border extends 3.223 centimeters above the horizontal line of fixation—2 degrees, 58 minutes.

6. The lowermost border extends 5.169 centimeters below the horizontal line of fixation—4 degrees, 47 minutes.

7. Thus the vertical diameter of the Blind Spot measures 8.393 centimeters—7 degrees, 45 minutes.

The size of the blind spot varies depending upon whether the testing mark is moved towards the area or away from the area. This variation is probably due to the persistent after-images or retinal drag. He found quicker responses on the part of the patient when the testing mark was carried away from the periphery towards the Blind Spot. The delineation of the Blind Spot is seldom the regular oval figure which we are accustomed to think of. The variations in the shape are probably due to differences in the sensitiveness of the retina, where it borders upon the disc and to the pressure of the vessels at these points. In a few intelligent patients and with great care, it is possible to plot off the course of the larger vessels (usually four in number), where they pass on to the perceiving retina. The blind areas resulting from these vessels are usually only relative.

J. M. W.

VITREOUS

THREE CASES OF UNUSUAL VITREOUS OPACITIES.—STARK, H. H. El Paso, Texas (*Arch. Ophthalm.*, Jan., 1917, XLVI, 38), reports three cases of vitreous opacities and discusses the possible etiological factors. He is inclined to believe that lues plays an important role in the etiology.

W. R. M.

ABSTRACTS FROM JAPANESE LITERATURE

ABSTRACTS FROM THE "NIPPON GANKAKAI-ZASHI."
(January-July, 1916.)

PROF. DR. KOMOTO,

TOKIO.

DR. HARRY S. GRABLE,

CHICAGO.

January.

UCHIDA. A SECOND CASE OF MYXO-SARCOMA OF THE OPTIC NERVE. A usual case of myxo-sarcoma in a 16-year-old girl, with the interesting feature of unusually good vision as compared to the usual tumor of the optic nerve. Even after operation, the retinal

vessels were not appreciably diminished in caliber, which fact the author attributes to an abnormal anastomosis of the cilio-retinal vessels.

MERI: CONCERNING ANOMALIES OF THE COLOR SENSE IN CENTRAL RETINITIS AND RETRO-BULBAR NEURITIS AS STUDIED WITH THE ANOMALOSCOPE. The author found that in central retinitis, yellow is mistaken for red and in retro-bulbar neuritis, yellow for green.

KAGOSHIMA: EXAMINATION OF THE EYES IN THE MIDDLE SCHOOLS OF KUKUOKA. The individuals studied varied from 13 to 19 years of age. Myopia increased as the age increased; during the earlier years it was found in only 3.39%, while during the nineteenth year it occurred in 45.45% of the cases. Color blindness was present in 4.67%, but was absolute for red and green only in 1.86%, whereas the remainder of the color deficiency was of a relative nature.

MASHITA: OPTICAL IRIDECTOMY. The author recommends the praecorneal iridotomy and gives his experience.

NOGOWA: A REMARKABLE CASE OF KERATITIS PARENCHYMATOSA WITH HIGH DEGREE OF BONE CHANGES (SABER LEG) OF A HEREDITARY SYPHILITIC NATURE. A case from the Tokyo University Eye Clinic of typical keratitis parenchymatosa, in which both tibiae were extremely thin and strongly curved forwards (so-called saber leg). It must have been an extremely unusual bone deformity as such a case had never been observed before.

ODA: A NEW FORM OF FIXATION FORCEPS. The forceps end in a small ring, which is corrugated. The advantage lies in that they do not tear the conjunctiva as so frequently happens in the case of older individuals with the usual fixation forceps.

ONISHI: A KIFE FOR THE DISSECTION OF THE CORNEAL LAYER IN TREPHINING. The author's own knifs for the exfoliation of the corneal layer in the Glaucomatous trephining operation.

February.

SUGANUMA: THE VITAL STAINING OF THE CORNEA. The author succeeded in accomplishing the vital staining of the cornea by intra-corneal injections of lithium carmine, whereby the corneal bodies were stained and the other cells remained uncolored.

KULYAMA: HISTOLOGICAL EXAMINATION OF FATTY DEGENERATION OF THE CERNEA FOLLOWING KERATITIS PARENCHYMATOSA. A case of a 40 year old man with bilateral diffuse grayish white opacities of the cornea of varying depths and anamnesticly following keratitis parenchymatosa during the eleventh year of his life. Similar to Takayasu and Tertsch, the author found a typical fatty degeneration in the corneal lamellae and a disappearance of Bowmann's membrane (Absorption?).

NAGANO AND ODA: EFFECT OF NEOSALVARSAN UPON SYPHILIS OF THE EYE.

SHIKANO: A CASE OF PARINAUD'S CONJUNCTIVITIS. A very severe case with extensive papillary hypertrophy of the conjunctiva and purulent secretion, so that the picture simulated that of a conjunctivitis blenorrhoica without gonococci. The bulbar conjunctiva was very hyperaemic and the cornea, near the upper limbus, the seat of a diffuse opacity. The cornea was overlaid with oedematous conjunctiva to such an extent that the pupil was scarcely visible. Pre-auricular and cervical lymphglands enormously enlarged. Histologically, the conjunctiva was very rich in plasma cells, but showed no trachoma follicles.

KAGOSHIMA: THREE CASES OF KERATITIS SUPERFICIALIS MARGINALIS, THEIR HISTO PATHO LOGICAL PICTURE AND THEIR RELATION TO PERIPHERAL GROOVE FORMATION IN THE CORNEA (RINNENBILDUNG). From the histological examination of extirpated pieces, the author arrived at the following conclusions: The disease appears in middle-aged men and affects the cornea with short recurrences, appearing each time as a thin superficial ulcer near the limbus with exaggerated subjective symptoms. The ulcer spreads over the entire corneal surface. Following the ulcer, there remains a superficial opacity, microscopically visible by a cellular infiltration in the superficial layers of the parenchyma. The superficial epithelium is very much thickened and Bowmann's membrane partially destroyed and partially infiltrated with cells.

MIYASHITA: CONCERNING THE QUESTION OF IMMUNITY IN TRACHOMA. A resume of the same author's article on this question that appeared in the *Klin. Monats. Bl. f. Augeheil.*, December, 1908. A patient with an acute trachoma of the right eye showed an intact left conjunctiva, although there were definite clinical signs of a previous attack of trachoma in this eye. The left eye was inoculated with material from the right eye. No irritation

developed within three days and material from another case of fresh acute trachoma was again inoculated. Eight days later, a typical acute trachoma made its appearance in this eye. The author concludes from this experiment that a conjunctiva that has undergone a light trachoma attack has a certain degree of immunity, but insufficient to withstand inoculation with material from an acute fresh case.

KUSAMA & KUIUDAS: CONCERNING THE OCULAR HYGIENE IN THE SCHOOL OF NOBILITY (GAKUSHIUN). This school takes the young people from the best families and is divided into three portions—elementary, middle and high school. Five hundred and eighty-three individuals were examined in all. Myopia was present in 16.1%, hyperopia 6.0%, astigmatism 3.6%, while 74.9% were emmetropic. Myopia increased from the elementary through the middle and high schools from 3.19% to 24.89% up to 42.50%. If one contrasts the Myopia in the middle school with Myopia in other middle schools, it is found to be higher by 5.10%.

ONISHI: A SIMPLE NEW PERIMETER.

KOMOTO: SHORT COMMUNICATIONS.

March.

SUGANUMA: PATHOLOGICAL EXAMINATION OF A CASE OF PRIMARY AND HEREDITARY LUTIC KERATITIS-PAREMCHYMATOSA. The enucleated eye of a typical case of Keratitis-Paremchymatosa was subjected to a careful examination with the following result: General atrophy of the epithelial layer—near the limbus a sub-epithelial inclusion of a pannus tissue, in the parenchyma a dilatation of the lymph spaces—increase and necrosis of the corneal bodies—increase of the wandering cells—infiltration by white blood cells—coagulation and necrosis of the corneal lamellae. Descemet's is well preserved, although the endothelial cells are lacking in the central area. At the root of the iris and in the ciliary projections are accumulations of cell infiltrates—the vessels of this region are partially obliterated. In the superficial layers of the sclera is a cellular infiltration, and the marginal vessels of the cornea show an increase in the endothelial cells and collections of white blood cells. The author believe that the disease can be traced to the syphilo-toxic influence which first develops its effect on the corneal bodies within the corneal parenchyma, followed by an increase and eventual necrosis of these cells.

NÄKANURA & UYEHARA: SCOTOMA AS A HYSTERICAL SYMPTON. Bilateral scotoma in the central visual field of a hysterical individual.

SHIMITSU: A NEW CORNEAL KNIFE. The knife has at its tip a small pyramidal cutting edge which on section can be forced in several millimeters. It is used in the case of a shallow anterior chamber in order to incise the cornea or sclera. It is also useful for cyclo-dialysis.

KAGOSHIMA: A MEASURE OF THE PUPILIARY DISTANCE, MADE OF GLASS.

MIKAMO: EXPERIENCE FROM MY 30 YEARS' OF OPHTHALMIC PRACTICE.

ONISHI: CONCERNING THE ARTIFICIAL EYE. The technique of fat implantation.

April.

ISHIWARA: CONCERNING THE NOMENCLATURE OF DISTURBANCES OF THE COLOR SENSE AND THE NEW PSUEDISOCHROMATIC TABLE. The author has constructed a modification of the psuedisochromatic table that has proven so useful in our practice.

KOMOTO: CONTRACTION OF THE PUPIL AFTER DEATH. The author experimented from various vertebrates concerning the post-mortal contractions of the pupil, taking into consideration various irritations of the pupil produced during life. After death the pupils of fish, fowl and turtle dilate while those of mammals contract. Eserine when used before death retains its effect while atropine does not. Eserine and adrenaline act upon the pupil after death while atropine does not. Warmth and cold act differently upon the pupils of different animals.

KOMOTO: THE RESORPTION IN ABILITY OF THE CORNEA. The author used the Bellarmino Fluorescein method upon the eyes of rabbits with the following result: Atropine increased the effect thus proving Leber's hypothesis; that the circulation of fluid in the anterior chamber is slowed by the increase in the diffusible material of the aqueous humor. Eserine on the contrary does not produce any such effect. Adrenaline, in large quantities, increases this effect, whereas in small quantities, decreases it. The cause of this increase lies in the change of the corneal tissue, and the cause of the decrease, in the anemia of the conjunctival sac, which lat-

ter factor up to the present time has been regarded as one of the causes of the increase. Immediately after death these conditions are not materially changed; then they decrease distinctly for about 10 hours and eventually after 24 hours attain the same values as they reach during life. This post-mortal decrease in corneal resorption must be regarded as a decrease in the vital activities of the cells. The author also expressed the belief that the transformation of the dissolved substances by the cornea is not merely a physical process but must be considered as a functional activity of the cell.

ONISHI: REGARDING TREPANATION. A thorough discussion of the various technique of trephining and forms of the trephine used by various authors.

KOMOTO: SHORT COMMUNICATIONS.

May.

INOUE: PICTURES FOR THE VISUAL TESTING OF CHILDREN.

MATSUOKA: ANATOMICAL FINDINGS OF A PRIMARY LESION OF THE CONJUNCTIVA WITH SPIROCHAETES. Author saw a ten-year-old boy with a primary lesion of the lower conjunctiva that contains typical spirochaetes. Wasserman at first negative, after 12 days weakly positive and strongly positive only on the third test after 20 days. The diseased area was extirpated and examination showed lymph cells, polynuclear leucocytes and plasma cells with but little connective tissue. Many spirochaetes were found in the superficial tissue, but few in the tissue of even moderate depth. The vessels of the periphery showed a high degree of endovasculitis; the elastic fibres of the vessel walls were irregular and partially destroyed as shown by the Weigert stain.

MARUO: CURES IN A TRACHOMA INSTITUTE.

FURUKAWA: THE THERAPY FOR SERPIGINOUS ULCER. The author prefers keratotomy to galvanocautery and advises this to be done as early as possible, at the same time employing radical treatment for any tear-sac inflammation.

MYASHITA: A CASE OF SERO-FIBRINOUS IRIDO-CYCLITIS WITH SPIROCHAETOSIS ICTERO HAEMORRHAGICA. In Weil's disease, which is endemic in southern Japan, spirochaetes have recently been discovered by Professor Inada. Frequently during the febrile attacks of this disease and for a long time afterwards, ocular in-

flammation in the nature of an irido-cyclitis occurs. The author saw such a case in Osaka where the irido-cyclitis appeared 30 days after the outbreak of the disease. He believes the ocular condition to be due to the toxæmia dependent upon the destruction of the spirochaetes.

NAKAMURA: CONCERNING OCULAR INFLAMMATION IN SPIROCHAETOSIS ICTERO HAEMORRHAGICA. The author had the opportunity of examining 111 men and 18 women with this disease and found ocular complications in 28.7 per cent. The most of these were cases of vitreous opacity of varying degrees and in only a few were there exudates or precipitates in the anterior chamber. The eye complication usually appeared from 51 to 110 days after the beginning of the disease, most frequently however, between the 61st and 90th day. Only once was there a recurrent vitreous haemorrhage seen.

KOMOTO: AN UNUSUAL FORM OF RETINAL DISEASE WITH MILIARY ANEURISMS. In a 16-year-old boy, who had suffered from this disease for 3 years, the author saw in the retina of the right eye many small white masses particularly in the neighborhood of the macula, occasionally confluent, and over which the vessels passed without disturbance. In the center of the macula was an irregular white mass and on the nasal side of the disc a large crescentic area where the small white masses laid so close together that the picture resembled that of a retinitis-circinata. But the interesting feature was the presence of small aneurisms that lay along the smaller vessels like pearls. In one area above the disc these were multiple and combined with hemorrhages so that the two were difficult to differentiate. In the peripheral vessels, the aneurisms were relatively large but in the macula they appeared as small red points. The disease did not change during the three months of observation. This picture has been but seldom described and is unquestionably the first one seen in Japan.

ONISHI: EOSINOPHILIA IN VERNAL CATARRH. The author concludes from extensive examinations that in vernal catarrh, eosinophilia is variable. These cells may be increased in the blood, tissues and secretions in greater or less quantities. On the other hand they may be entirely lacking. Consequently an absence of eosinophiles does not vitiate the diagnosis of vernal catarrh.

KOMOTO: SHORT COMMUNICATIONS.

June.

TAKASHIMA: THE EFFECT OF EEL SERUM ON THE EYE. This is a continuation of a former work along the same line. The author could not find any especial individual difference in rabbits as some have contended. With the gall, he was not able to obtain the effect so characteristic of eel blood, nor could he find the central influence against eel blood toxins by calcium salts as Steindorf maintained. The myosis which appears upon intravenous injections of eel blood is not alone due to the iris hyperaemia but is also dependent upon the nervous shock. Injections of large doses may cause mydriasis. The isolated blood albumen is very toxic whereas the globulin has practically no influence.

KUBOKI: A CASE OF PLASMO-CYTOMA. In a 27-year-old woman there appeared a tumor at the inner canthus that covered the cornea. The Pre-auricular and cervical glands of the same side were enlarged. The tumor consisted of plasma cells grouped in follicles; the interstitial tissue was mostly fascicular but in places, much thickened.

HIWAIARI: ANATOMICAL FINDINGS OF THE CONJUNCTIVA IN A 10-DAY-OLD CHILD IN REGARD TO THE DEVELOPMENT OF THE PAPILLAE. The author found the simple epithelial layer with every cell slightly cylindrically formed and the surface of the conjunctiva not perfectly smooth but somewhat irregular so that there were alternating depressions and elevations. In the elevated areas, the epithelial cells were increased. The propria of the conjunctiva consisted principally of connective tissue with but few cells without any adenoid tissue. The vessels were well developed, especially in the elevated areas which the author regard as the anlage of the future papillae. But little literature can be found on this subject.

NOGAWA: CLINICAL AND HISTOLOGICAL OBSERVATION OF SYMPATHETIC OPHTHALMIA. Two cases of sympathetic inflammation following operation on the other eye and another case following slight injury to the lower limbus were examined histologically with findings of the so-called characteristic picture. The author emphasizes that even minute injuries are etiologically important and must not be neglected.

SHIETA: HISTOLOGICAL CHANGES OF THE RETINA IN A TUMOR OF THE OPTIC NERVE SHEATHS. The author found in the lower equatorial portions of the retina and chorioid, an atrophy in a case of a tumor of the optic nerve sheaths.

MIKAMI: SEROUS IRIS CYSTS. Description of two cases of iris cysts following injury with the histological findings.

UTSIDA: A CASE OF PAPILLOMA OF THE TEAR SAC. The author described a skin papilloma appearing from the mouth of an open tear-sac wound and believed that it was due to the secretory irritation of the skin that was rolled in, similar to the formation of a condyloma.

ISHIDA: CONCERNING THE LOCATION OF THE OPTIC GANGLION. The author made measurements on anatomical preparations of 12 Japs and 8 Europeans for the location of the ganglion which is so important in intra-orbital anaesthesia. It was found to lie deep between the optic nerve and the external rectus muscle about 4 centimeters behind the skin of the external margin of the bony portion of the organ.

ISHIDA: A TYPICAL BELL'S PHENOMENA. The case of a man with ectropion due to burn with hot water with undisturbed ocular movements but rotation of the eyeball downwards upon closure of the eyelids. Citation of a similar case following a Pagenstecher operation for ptosis.

FURUKAWA: ALCOHOL INJECTION FOR FACIAL CRAMP.

KOMOTO: EXCISION OF THE CONJUNCTIVA WITH MUSCLE AND TARSUS IN TRACHOMA. The author is of the opinion that the constantly changing picture of trachoma requires individualistic treatment. Frequently one sees a thickening tarsus with a conjunctiva that is complete scarred. In these cases his own operation yields good results. His technique is as follows: Lid clamp, complete extirpation of the external skin, muscle and tarsus with conjunctiva, with a resultant hole through the upper lid. This is sewed together. Following the operation the lid is much lighter and the entropion and trichiasis due to convex tarsus, disappear.

ONISHI: MICROSCOPICAL PREPARATION OF A COMPLETE MEMBRANA PUPILLARIS PERSISTENS. Author had occasion to extract such a membrane and examine it microscopically.

ONISHI: CASES OF RETINITIS EXUDATIVA. One case in a 11-year-old boy in the left eye and a similar case in the left eye of a 29-year-old man.

Book Reviews

The American Encyclopedia and Dictionary of Ophthalmology.—Wood, Casey A., M. D., C. M., D. C. L., assisted by a large staff of Collaborators. Fully illustrated. Volume IX—Institutions for the Blind to Lemotes. Chicago, Cleveland Press, 1916.

Volume IX comprises an exhaustive study on Institutions for the Blind, the Iris, Keratitis, Lacrimal Apparatus and Legal Relations of Ophthalmology with many minor subjects.

The last article, by Shastid, is the most exhaustive written in the English language and is of exceeding value to the oculist.

The other subjects of the volume are well written, the book is well printed, illustrated and bound.

H. V. WÜRDEMANN.

Cataract, Senile, Traumatic and Congenital.—Fisher, W. A., M. D., Chicago. Published by Chicago Eye, Ear, Nose and Throat College, 1917.

This is a reproduction and a resumé of a number of recent papers by the author, several of which were published in *Ophthalmology* upon the subject, giving the main subject of intra-capsular operation with a summary of 94 consecutive operations in America.

Short papers on traumatic cataract in the adult and congenital cataract are appended.

H. V. WÜRDEMANN.

How to Live: Rules for Healthful Living Based on Modern Science.—Fisher, Irving, and Fisk, Eugene Lyman, M. D. Eight Revised Edition. Funk and Wagnalls Company, New York and London, 1916.

This is a book for popular consumption. The purpose of the Life Extension Institution embraces the extension of human life, not only as to length, but also, if we may so express it, as to breadth and depth. It endeavors to accomplish this purpose in many ways, but especially through individual hygiene.

"A great health movement is sweeping over the entire world. Hygiene has repudiated the outworn doctrine that mortality is fatality and must exact year after year a fixed and inevitable sacrifice. The practice of medicine, which for ages has been known as the 'healing art' is undergoing a gradual but radical revolution. This is due to the growing realization that an ounce of prevention is worth a pound of cure. Furthermore, the preventive methods

of modern medicine are being applied by the people themselves, as witness the great vogue today of sleeping out of doors."

It is recommended for the library and for family use.

H. V. WÜRDEMANN.

A Journey Around the World by an Oculist—Tiffany, Flavel B., A. M., M. D. Franklin Hudson Publishing Company, Kansas City, Mo.

The book is a journey around the world by an oculist, and embraces his impressions not only in the various things that would interest the layman, but the professional man, especially the ophthalmologist. He visited the important eye clinics of the world and discussed many of the important subjects pertaining to ophthalmology. This trip embraces visits to the eye clinics of London, Paris, Munich, Vienna, Buda-Pesth, Athens, Cairo, Palestine, Bombay, Calcutta, Colombo, Singapore, China, The Philippines, etc.

The book will contain about 400 pages and is bound in an attractive cover. It is 5x7 inches and contains about 100 illustrations.

H. V. WÜRDEMANN.

Obituary

G. HUDSON MAKUEN.

In the death of Dr. Makuen (February 21, 1917), the Philadelphia Medical Club has lost one of its best after-dinner speakers. He had a natural flow of eloquence, made still more striking by his cultured and refined manner. At one time he was one of the brightest and best instructors at the National School of Oratory in this city.

Dr. Makuen was graduated from Yale in 1884. He was a member of the Psi Upsilon and also the Scroll and Key. During his sophomore year he received the first prize in English composition and in declamation. In the junior exhibition he won the first prize, and in his senior year edited the *Pot-Pourri*.

Dr. Makuen was interested in Yale athletics and he always showed the true Yale spirit when the great football games were being played. It was at a meeting of the Yale Club in Philadelphia this past winter that the writer of this memoir met Dr. Makuen as his guest. This was the occasion when Yale defeated Harvard. The news was brought over the special wire, and it was an inspiration to see the enthusiastic countenance of Dr. Makuen and to hear his cheers at each successful move of the Yale heroes. Little did we think that the Reaper, Death, would so soon claim one of our party, and especially Dr. Makuen, who was apparently so well and bright.

Dr. Makuen was born in Goshen, N. Y., July 16, 1855, the son of George and Ellen Gertrude Makuen. He prepared for college at the Centenary Intercollegiate Institute, Hackettstown, N. J., and entered Yale in 1881. In 1889 he received the degree of M. D. from the Jefferson Medical College. He began his practice and after several years took up the specialty of laryngology, rhinology and otology. He gave special attention to the defects of speech and voice, where he was most successful. In 1897 he was elected professor of defects of speech at the Polyclinic Hospital and College for Graduates in Medicine in Philadelphia. He was also consultant to several other hospitals and institutions.

In 1899 Dr. Makuen was elected president of the Yale Alumni Association of Philadelphia, and as a representative of that association addressed the alumni of Yale and other colleges.

The Society of American Laryngology, Rhinology and Otology elected him president, and the American Laryngological Associa-

tion conferred the same honor upon him in 1916. In 1809 he was a delegate to the International Congress in Budapest. Dr. Makuen was a fellow of the American College of Surgeons, a member of the University and Art Clubs, Philadelphia Medical Club, the College of Physicians of Philadelphia, and the Alpha Mu Pi Omega Medical Fraternity.

On December 20, 1900, Dr. Makuen married Nancy Baker Dyer, daughter of George Dyer, a banker of Chester, Pa., where they lived until 1914, when they moved to Newfield, N. J. Dr. Makuen went for a visit of a few days to his boyhood home at Goshen, N. Y., and while there died very suddenly from heart trouble.

The medical profession, not only in Philadelphia, but throughout the country, mourn his death. Dr. Makuen was gentle by nature and a gentleman by birth.

L. WEBSTER FOX.

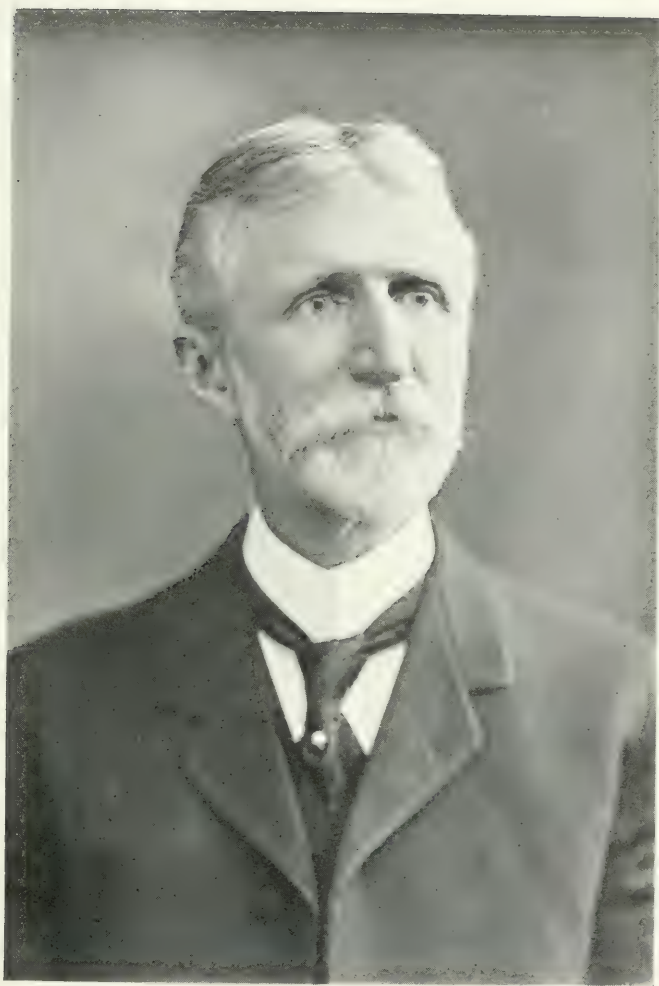
DR. WENDELL REBER.

In the death of Dr. Wendell Reber ophthalmology has lost a brilliant member, while not a native of Pennsylvania, yet by the influence which seems to surround all who live in its atmosphere this young man became one of its brightest stars. Coming from a neighboring town some years ago he, by his forceful personality soon made for himself a position which was respected by all of his confreres. A splendid diagnostician with a mathematical mind soon brought him before the profession as one of our best exponents of refraction—a true follower of the rules laid down by the late Dr. William Thomson. A thorough and careful instructor, revered by all his students, not only in Temple College, but also in his Polyclinic work.

It was during the meeting of the American Academy of Ophthalmology and Oto-Laryngology, held in Memphis during December, that he contracted a bronchitis, which eventuated into pneumonia and was the cause of his death, December 30, 1916.

Born in St. Louis in 1867, Dr. Reber was graduated from the Washington Medical School, and later in 1893 from the Jefferson Medical College in Philadelphia. He was professor of Ophthalmology in Temple University, visiting ophthalmologist to the Samaritan Hospital, Philadelphia General, Polyclinic and Garretson Hospitals, and professor of Ophthalmology in the Philadelphia Post-Graduate School, and consultant to several other institutions.

He was recently chosen a member of the Council of Ophthalmological Congress at Oxford, being the only American thus hon-



G. HUDSON MAKEN.



Wendell Weber

ored. He had received many honors in the United States, among them being the Presidency Academy of Ophthalmology and Otolaryngology and the Philadelphia Clinical Association. He was affiliated with many other societies, among them being Philadelphia County Medical Society, the Medical Society of the State of Pennsylvania, the American Medical Association, the American College of Surgeons, and the Philadelphia Medical Club.

During the last session of the Pennsylvania Legislature, when many of the optometrists of the United States were attempting to pass a law legislating their methods Dr. Reber was selected chairman of the Commission on the conservation of vision for this state to fight this bill, and it was largely through his efforts that the optometrists were defeated.

He was a pleasing writer, always giving us the meat of the subject matter without the verbosity that is frequently met with in men who are prolific with their pen. After Stevens and Savage he was probably the most acceptable authority on heterophoria and the muscular anomalies of the eye. He was not only a valuable contributor to various ophthalmic literature, but his work will always stand out most brilliantly in his contribution to Wood's ophthalmic operations, and also as a collaborator of the American Encyclopedia and Dictionary of Ophthalmology.

We, of Philadelphia, regret his untimely death. He was an affable man and in consequence had a host of friends, not only in the state of Pennsylvania, but throughout the United States and abroad. His confreres mourn, with his widow, the loss of such a valuable member of the ophthalmic profession.

L. WEBSTER FOX.

WILLIAM L. RODMAN, M. D.

Dr. William L. Rodman, the twelfth president of this organization, died March 8, 1916, after a very short illness at his home, 2106 Walnut Street. At the time of his death he was president of the American Medical Association, an organization of more than 76,000 practicing physicians and surgeons in all parts of the world.

It was during Dr. Rodman's term of office that the club had the great distinction of entertaining, for the first time in its history, a President of the United States. President William H. Taft was exclusively the guest of our medical society. On this occasion

Read at a meeting of the Medical Club of Philadelphia, January 19, 1917.

President Taft made a remarkable speech on which he praised the medical profession of our country for the wonderful scientific work accomplished in Cuba and the Philippines during the Spanish-American war. He laid especial emphasis on the splendid pioneer work done by doctors in making the building of the Panama Canal possible. Not the least pleasing was the compliment he paid to our own specialty as representing the best and noblest of all the professions.

Dr. Rodman was born in Frankfort, Kentucky, September 7th, 1850. His father was Gen. John Rodman, a distinguished Kentuckian, who for many years was Attorney-General of that state. His ancestors originally settled in Bucks County of this state before moving to Kentucky. His preliminary education was received at the Kentucky Military Institute, from which he was graduated in 1875 with the degree of M. A. Later on the institution conferred on him the degree of LL. D. It was at the advice of his uncle, Dr. James Rodman, and his cousin, Dr. W. B. Rodman, that he commenced the study of medicine at the Jefferson Medical College, and was graduated in 1879. It was during those college days that the writer of this paper formed a friendship which continued to grow stronger with advancing years.

After Dr. Rodman finished his internship as house surgeon at the Jefferson Hospital he entered the United States Army as acting assistant surgeon and was stationed for nearly two years at Fort Sill, I. T. In 1884 he moved to Louisville, Kentucky, and was at once appointed demonstrator of surgery in the University of Louisville Medical Department, and clinical assistant to Dr. David W. Yandell, one of the great friends of our late Professor Samuel Gross, beloved by all the older Jefferson graduates.

In 1893 Dr. Rodman was elected professor in the Kentucky School of Medicine, Louisville, and 1898 he was elected to the chair of the Principles of Surgery and Clinical Surgery to the Medico-Chirurgical College, made vacant by the death of Professor W. H. Pancoast, and in 1898 he was elected to the Chair of Surgery in the Woman's Medical College, Philadelphia.

I shall not attempt to note the various societies with which Dr. Rodman was affiliated, for they were numerous. He was a man who honored a society by his membership.

Dr. Rodman was deeply interested in the organization of the National Board of Medical Examiners. In fact it was due to his untiring energy and perseverance that it has become an accomplished fact. He first conceived the idea of a National Board of



W. H. Loomis,

President American Medical Association, 1915-1916.

Medical Examiners in 1900, at which time he presented it to the American Medical Association at its meeting in Saratoga. It was turned down, but he did not give up the idea. Finally he succeeded largely through the help of the Carnegie Foundation. The present Board consists of many well known physicians and surgeons. This Board has honored his memory by placing on all its documents, private and official, the following sentence: "The National Board of Medical Examiners of the United States. Founded 1915 by W. L. Rodman, M. D." This splendid tribute to his memory will last as long as the Board exists.

His quasi-military career was renewed in 1909, when he was commissioned First Lieutenant Medical Reserve Corps, United States Army. This position brought him in touch with medico-military preparedness and the reorganization of the Medical Department of the Army. Ten days before his death he was the guest of honor at a meeting of the Caduceus Club of Washington, full of enthusiasm for the army medical service and for its legislative prospects. He considered this as the crowning achievement of his life work.

His last official act was to request his son, Dr. J. Stewart Rodman, to sign a letter which was to be sent to all the medical societies, urging them to bring pressure to bear on Congress in behalf of medical preparedness, a subject so dear to his heart.

From the time that Dr. Rodman was called to the Chair of Surgery to the Medico-Chirurgical College and Hospital he took a very active part in the upbuilding of the college and the hospital of his adoption. His work as a teacher and surgeon was demonstrated by his popularity among the student body. His lectures were impressive and noted for their clearness of thought. His wonderful memory and his analytical mind could give to the students, all that was best and most essential for their practice. He not only drove his facts into the mind of the student, but he had the faculty of clinching them as well. As an author he was recognized, not only in this country, but in foreign countries as well.

Privilege to quote from some of the letters and telegrams sent to the family has been granted to me by Dr. Rodman's family. One friend has written: "By his achievements he left his country and his chosen calling, other and better than he found them. By assisting in the betterment of our professional standards and creating a body which should serve as an example, he made a definite contribution to the construction of society." Another says of him: "Dr. Rodman's unflinching courage and love of candor

were most clearly shown in the fight he waged against those who would prey on the fears of the poor and ignorant, ruthless extortioners of blood money. He was determined to drive out of the ranks of his profession any who for their own selfish ends disgraced it and these were his enemies and these alone." The last tribute to his memory was contained in a conjoint telegram to the bereaved family from two well known surgeons of the United States, in which they say: "In the death of Dr. William L. Rodman America loses one of its greatest surgeons, an untiring and unselfish worker, of high ideals whose influence for good upon the medical profession has not been exceeded by any man in this generation" (William J. and Charles H. Mayo).

His chief contributions to literature were the oration in surgery on "Gastic Ulcer," a paper on "Cancer of the Breast," read before the British Medical Society, "Diseases of the Mammary Gland," chapters contributed to three different Systems of Surgery, etc.

L. WEBSTER FOX.

News Items

COLD WATER APPLICATIONS.

To the Editor *Ophthalmology*, Seattle, Wash.—Sir: In connection with escape of vitreous in the intra-capsular extraction of cataract, I suggest cold water applications to the eye one or two hours before operation. This can be done easily if the eye be kept covered with cold water pads while it is being prepared for operation. I have found this measure very useful in preventing escape of vitreous in prominent eye balls. Cold applications diminish the quantity of fluid in the orbital fat surrounding the eye ball. The depression of the capsule of the eye ball is therefore less when the intra-ocular pressure diminishes at the time of operation. I think that cold applications reduce the quantity of fluid in the contents of the eye ball also. Yours, etc.,

HARI SHANKER.

Delhi, India.

FELLOWSHIPS IN OPHTHALMOLOGY.

Special Fellowships in Ophthalmology and Oto-Laryngology in connection with the University of Minnesota have been established by Dr. Frank C. Todd of Minneapolis, and Dr. Frank E. Burch of St. Paul, both connected with the teaching staff of the School of Medicine. These Fellowships carry with them the same stipend that is paid by the University of Minnesota to the University Fellows, viz., \$500.00 the first year, \$750.00 the second year and \$1,000.00 the third year. Such Fellows will spend one half of their time in the private clinic of Dr. Todd or Dr. Burch, and the other half in laboratory and clinical work and in pursuit of certain courses for specialists in Ophthalmology and Oto-Laryngology at the University of Minnesota. For work done in these private clinics credit will be given toward the degree granted by the University in the course of Ophthalmology and Oto-Laryngology given at the University of Minnesota to accepted Doctors of Medicine covering a period of three years, which prepares the physician for the specialty of Ophthalmology and Oto-Laryngology. Applications for these Fellowships may be made to the chief of the department of Ophthalmology and Oto-Laryngology, Dr. Frank C. Todd, Minneapolis, Minn.

AMERICAN MEDICAL EDITORS' CONVENTION

The annual meeting of the American Medical Editors' Association will be held at the McAlpin Hotel, New York City, on June 4th and 5th, under the presidency of Dr. G. M. Piersol, editor of the *American Journal of Medical Sciences*.

A most interesting and instructive program is now being prepared and it is contemplated that the forthcoming session will be the largest ever held in the history of the Association.

The 48th anniversary of this Society will be celebrated by a banquet on the evening of June 5th, at the McAlpin Hotel.

THE PROPOSED MERGER OF AMERICAN OPHTHALMIC JOURNALS

Within a year two leading Italian ophthalmic journals have combined. Such a combination has been suggested in France; and in England the Royal London Ophthalmic Hospital Reports, the Ophthalmic Review, and the Ophthalmoscope, have been merged in the British Journal of Ophthalmology, the only ophthalmic journal now published in the British Empire.

Will you join in securing a representative American ophthalmic journal, second to none in the world? This is possible through the combination of American ophthalmic journals now published, if enough ophthalmologists will subscribe for it to justify the merger of these journals.

The annual subscription to such a journal will not be over half that of the publications that will be merged to form it. In it will be brought together under one arrangement, without duplication, what is valuable in all of them. The change will give you more value for less money. It will enable you to learn more of ophthalmology, with a smaller expenditure of time and effort.

If you have been taking several ophthalmic journals you will at once ap-

preciate the advantage of this change. If you have not been taking more than one, it will certainly be wise to have the best. You want the most important papers published in this country and the abstracts of the world's literature relating to your work.

This journal will be planned and brought out by those who have had valuable experience in the conduct of ophthalmic periodicals in this country, associated with representatives of the national ophthalmological organizations. It will be conducted and controlled by a stock company, composed of ophthalmologists; and all surplus income, over a low interest on capital invested, will be applied to the improvement of the journal, and in doing other things that will benefit its subscribers.

To get this benefit you must cooperate. You must have the journal in your own library; and it can only be brought into existence by the general support of the profession. Every subscriber will make it possible to do a little more to increase the value of the journal, or to lessen its cost to the individual supporter.

Please let us know on the accompanying card if we can count on your assistance; and also if you wish information with regard to the stock of the company.

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OPHTHALMOLOGY

ESSAYS, ABSTRACTS and REVIEWS

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No. 4.

Original Articles.

EYE STRAIN

MAJOR M. CORRY, M. D., I. M. S., AND RAI PUNDIT HARI SHANKER,
DELHI, INDIA.

Ernest Clarke, in his excellent book on refraction of the eye, defines eye strain as a symptom or group of symptoms produced by the correction or attempt at correction by the ciliary muscle of an error of refraction or as a want of balance between the external muscles of the eye. He groups the symptoms of eye strain under three headings.

1. Manifestations on eye and lids.
2. Peripheral irritation.
3. Nerve exhaustion.

He says "with the parts thus rendered specially receptive to infective germs there is little difficulty in understanding that inflammations should ensue and thus we find that blepharitis, corneal ulcers, phlyctenulae, iritis, cyclitis and glaucoma may have eye strain as one of the predisposing causes. There is little doubt that cataract may be started by the irregular contraction of the ciliary muscle in correcting low errors of astigmatism, and that the correction of these errors with the consequent disappearance of the eye strain, will stay the progress of the disease."

Thorington, on reflexes due to eye strain, says: "Many patients who suffer from headaches, ocular pains, etc., during the use of their eyes also very frequently suffer from constipation, indigestion, heartburn, nausea or even vomiting. Other patients may have nervous attacks, a fear of some impending calamity, or they are irritable and despondent; they may suffer from insomnia or, if they sleep it is not a restful sleep. Others may have epileptic attacks, nervous twitchings, etc. To just what extent eye strain is responsible for these and many other reflexes the writer is not prepared to say, though every ophthalmologist has certainly seen *some* cases of accommodative and muscular asthenopia with gastric

symptoms or nervous symptoms or epileptic attacks or irritable tempers or insomnia or enuresis, etc., in which these reflex symptoms entirely disappeared after the eye strain was properly treated."

Ernest Clarke rightly says: "Eye strain, as we now understand it, extends over a far wider field than it did even 25 years ago." In a few years' time we hope it will have a still wider significance.

We find that not only the symptoms of watering of the eye, itching, redness, blinking, sneezing, intolerance of light, headache, burning feeling in the eyelids, heaviness of the lids, head twitching, pain in the neck, vertigo, insomnia, neurasthenia, and sexual impotence, etc., are due to eye strain, but also different varieties of conjunctivitis, acute and chronic, follicular conjunctivitis, conjunctivitis trachomatousum, conjunctivitis eczematousum, pterygium, xeroses, keratitis, pannus, symblepheron, corneal opacity, episcleritis, iritis, eyelitis, chorioiditis, glaucoma, cataract, retinitis, optic neuritis, amblyopia, ptosis, blepharitis, hordeolum, chalazion, trichiasis, entropion, ectropion, blepharospasm, dacryocystitis, diplopia, squint, nystagmus, nasal catarrh and its complications, etc., are also directly or indirectly traceable to eye strain.

Practically the whole of ophthalmology can be classified under a few headings, namely:

1. Eye strain and its sequelae.
2. Tumours.
3. Injuries.
4. Diseases due to poisons in the blood.
5. Congenital defects.

Jones, of Watertown, N. Y., lays it down as an aphorism that "abnormal physiology is the origin of most pathology," and states that "the prevention of this morbid physiology by proper glasses prevents from 75 to 90 per cent of all inflammatory and surgical diseases of the eye." He says: "In fact there is no disease which the physician is called upon to treat that may not be due to or influenced by eye strain." We think that this certainly holds good for most of the inflammatory and degenerative diseases of the eye. It is admitted that different forms of conjunctivitis are the results of irritation. Amongst the sources of irritation are discussed infection, smoke, heat, dust, and glare, etc., but even in important standard books such as Fuchs' Ophthalmology, eye strain is either not mentioned at all or mentioned in a very casual way as a source of constant irritation to the conjunctiva. Take, for instance, the so-called disease trachoma. We agree with Walter of Odessa, when he says that as a result of thirty years' experience in a trachomatous

region he has come to the conclusion that trachoma is not a disease *sui generis* but expresses the reaction of the conjunctiva to various irritants. The irritant is, in our opinion, nearly always eye strain from refractive error or muscular imbalance. We have not yet been able to detect a single case who suffered from recurrent attacks of conjunctivitis or trachoma who had no eye strain.

So long as a man is in good health, has good food, lives in good hygienic surroundings and is not overworked, he can put up with the irritation caused by eye strain without pathological changes manifesting themselves, but when from ill-health and malnutrition his resisting powers become lowered the eyes also which share in the general economy of the body, begin to react to the irritation caused by eye strain and pathological phenomena, supervene in the shape of various forms of conjunctivitis, trachoma, etc.

Dust, glare and heat also join the eye strain in irritating the eyes, and bacteria which can so easily reach the exposed surface of the conjunctiva, begin to work and the conjunctiva hypertrophies. The important source of irritation in every case is eye strain. Dust, glare, smoke, heat and even infection play a comparatively secondary rôle; their effects are temporary and they do not generally cause reactionary pathological changes in a functionally sound eye.

We have always found eye strain to be at the bottom of these inflammatory reactions. We lately examined the eyes of many soldiers who thought their eyes had become bad since they came to India. These, on examination, were all found to have eye strain. In a cool climate like that of England these eyes, though irritated by eye strain, did not show a strong reaction, but under the added influence of dust, heat and glare pathological reaction occurred. Others, with functionally sound eyes, did not mind the climate of the plains of India. The eyes of some people are not affected by a dust storm in the hot weather in India but remain quite clear, whereas others get headache, their eyes become red and water if they only go out in the sun even for a short time. Some people do not remember ever having suffered from sore eyes, whereas others get recurrent attacks every hot weather; the latter, on examination, are found to have eye strain. Many drugs are used in the treatment of the so-called disease trachoma. Silver nitrate and other silver preparations, copper sulphate, carbonic acid, tincture of iodine, perchloride of mercury, and menthol, etc., have all been recommended; also expression with roller forceps, excision of the cartilage, excision of the upper fornix, cauterization and scraping have been practised but in the long descriptions of the disease given in

some of the standard text-books nowhere is the advice given to relieve the eye strain first with proper glasses.

Colonel Smith recommends an application of 1 dr. to 1 oz. of silver nitrate and says "a few such applications are enough for the worst cases." He comes to this conclusion "after a liberal trial of all the standard remedies for trachoma." He says "if we cannot cure a patient of his trachoma in from seven to fourteen days he comes to the conclusion that we are not going to succeed and we lose sight of him in consequence." (See Transactions of the Bombay Medical Congress, 1909, page 491).

We think the treatment of trachoma with medicines requires not a few applications only, but applications at intervals practically for the whole life of the patient.

Daniel White and Peter Cope White, of Tulsa, Oklahoma, whose results are based on a personal experience of 100,000 cases of trachoma among the Indians of the United States and among many thousands of the white and about 300 cases in the colored population, say that medicinal treatment has been found quite inadequate to deal with this disease problem but that they have obtained excellent results from the operation of removal of the tarsus and conjunctiva.

Unfortunately, nothing is said by them about relieving the eye strain first with proper glasses. A good deal appears to have been made out of the incidence of trachoma in several members of the same family, but on examination all these members are found to have eye strain. This also holds good for different races and different climates. So-called trachoma is very common in the Punjab and we are every day being consulted by many such patients. Our advice to them always is to first provide themselves with proper glasses and relieve the eye strain. The damage that has been done by past neglect can be treated with medicines. For this we paint the everted lids with a solution of 10 grs. to 1 oz. of silver nitrate or a solution of the same strength of menthol in liquid paraffin. Subconjunctival injection of sugar solution is also given sometimes with marked benefit, the patient is also advised to keep a cold water compress over his eyes for as long a time as possible.

In the text-books which are usually placed in the hands of students there is such a big gap left between the chapters on different forms of conjunctivitis and refractive errors, that the close association between them is entirely missed. Eye strain and refraction should be first discussed so that their bearing on other diseases may be appreciated. We report below cases, some of which give a

history of lifelong torture from having their eyes constantly touched up with caustics, etc., cases who were even operated on for trichiasis or corneal opacity, and no one ever thought of examining the eyes for eye strain. On examining these cases we discovered high degrees of eye strain and the patients felt much more comfortable after using these glasses than they did after all the medicinal treatment and operations they had undergone.

Many surgeons think that when an iridectomy is done for a corneal opacity or glaucoma, a pterygium excised, a trichiasis operation performed, a cataract extracted or a suppurating lachrymal sac removed they have done all that can be done for the patient. They will alter their opinion if they will only perform retinoscopy on the patient when the redness has passed off. They will discover that the patient is suffering from a tremendous amount of eye strain, which was the real cause of the disease for which the operation was undertaken. Proper glasses will not only give him better vision but will also protect him from subsequent attacks of conjunctivitis and increased tension of the eyeball (glaucoma). If this is not done the patient will very often say after optical iridectomy and after iridectomy for chronic glaucoma, that the operation has spoiled his sight. Attacks of conjunctivitis may continue and one day destroy the eye altogether. We always advise patients after these operations to come again for ophthalmoscopic examination when the eye operated on gets quiet. It is not as a rule very difficult to perform retinoscopy on these cases at a distance of one metre or less. This is one of the chief advantages of removing the lens entire in cataract operation. If there has been any fault in the operation, such as prolapse of iris, resulting in bad vision and the patient be unwilling to have another operation performed, he can be given good vision with the help of proper glasses, and this only means a little extra cost to him. If we are prepared to do this, the question of higher or lower astigmatism within a few degrees becomes a very unimportant one. Retinoscopy on these cases is highly interesting. We quote below many such cases in whom the lens was extracted entire upwards after making a preliminary conjunctival flap either with or without an iridectomy. Results of downward, outward or inward extractions by the same method will be published later on. Previous articles on the subject in the December 15, January, February, April, May and June, 1916, numbers of *Indian Medical Gazette* may be seen.

The cases of glaucoma given below will show that the assertion made by some that glaucoma is the result of hypermetropia is not

always true. It is generally the result of eye strain from astigmatism. Myopic astigmatism also accounts for some cases.

In cataract extractions in order to judge the amount of astigmatism resulting, we require to know the amount of astigmatism existing before the operation. An investigation of muscular imbalance in cases operated on for cataract is no less interesting, as the relationship of convergence to accommodation is much disturbed by the operation. In some of these cases the combination of prisms with the proper glasses gives great relief to the patient. The eye strain from anisometropia in cases where one eye is sound and the other eye has been operated on for cataract is also sometimes considerably relieved if glasses be prescribed after proper examination, otherwise the patient will often keep the eye operated on closed even though the vision in it with glasses is 6/6.

The usual practice in India of prescribing +10D. sph. for distance and +13D. sph. for reading for cases after cataract operation appears to be a very haphazard method of dealing with the matter. The patient will wear glasses in any case, so why not give him accurate ones if he can afford to buy them?

Now and then one comes across a case where the lens looks opaque in reflected light and the details of the fundus are not clearly visible with the ophthalmoscope. If a diagnosis of cataract is made the patient retorts by saying that he can read ordinary print comfortably and see distant objects also fairly well. Tried with test types his sight is found to be about 6/24. There is no doubt that there is some milky opacity in the lens or other transparent medium in these cases, but they do not require a cataract operation as sometimes the opacity remains stationary for ten to fifteen years or even longer, and vision with glasses comes up to about 6/6. These cases are generally myopes. *It should be remembered that the shadow test can be fairly easily performed even in cases in which the details of the fundus are very indistinctly visible by the indirect method on account of a cloudiness in the lens.* Some such cases are recorded below.

Cases are also recorded where phlyctenular conjunctivitis, sympathetic uveitis and even syphilitic iritis were traceable to eye strain. There will be found a case where the lens had a few detached pieces of iris on its front surface showing an old iritis and posterior synechiae. Wassermann's reaction in this case was positive. * * * On performing retinoscopy on her she was found to have a high degree of eye strain. Her husband, who also showed a positive Wassermann's reaction * * *, had no eye strain and no iritis

or any other syphilitic affection of the eye. It appears that in his wife's case the syphilitic poison specially selected the eye because it was working under a strain and was therefore more susceptible to it. It is possible that part of the refractive error was got by the irregular contraction of the ciliary muscle resulting from damage done to it by iridocyclitis. The case of sympathetic uveitis quoted below was also found to have eye strain. *The hard and fast line which is usually drawn between refractive errors on the one hand and the organic diseases of the eye on the other, requires to be abolished as the vast majority of the so-called organic diseases are but a result of eye strain.*

Headache. Ernest Clarke writes: "It is important to remember that with this headache there is often associated nausea and even vomiting. The so-called bilious headache of the "old school" is generally an ocular headache."

Eye specialists claim it is generally ocular; nose specialists claim it is due to nose trouble and sometimes striking results are obtained by a trivial operation on the nose or even a cocain and adrenalin spray. We are ourselves recording a case of this sort below. Physicians generally blame the liver and digestion. Gynecologists blame the reproductive organs. Young girls with such headaches complain of menstrual disorders which may be the result of eye strain but they are inclined to lay the blame on everything else except their eyes. Dentists associate these headaches with dental trouble. There are hundreds of headache cures on the market which give a temporary relief.

A surgeon thinks of cutting a nerve or excising a ganglion. Some patients say that a dose of seidlitz powder always relieves their headaches. Others prefer to rub menthol on their forehead and so on. In our opinion, this headache is generally reflex pain and proper glasses cure it with greater certainty than any other means. The same amount of eye strain does not produce the same degree of trouble in every case—the personal factor has got to be taken into account in this disease as in any other. Some cases of eye strain do not suffer from headache (see some of our cases recorded) but they nearly always get a sensation of fatigue or discomfort which is realized better after eye strain has been relieved with proper glasses. This fatigue is myalgic in character and of the same type as muscular fatigue in other parts of the body from over exertion. If the nerve endings in the eye are still more irritated by toxins, chemical poisons or mechanical pressure we get neuralgic pain which is referred to the head. If the eyes are functionally

sound either with or without glasses there are generally no headaches in spite of constipation, torpid liver or menstrual troubles.

Poisons circulating in the blood may help eye strain in causing hyperplasia of the spongy mucus membrane in the nose. The nasal mucus membrane appears to act as a safety valve for the cerebral and ocular circulation. The cavernous tissue of this membrane communicates directly with the superior longitudinal sinus through the foramen caecum, with the veins of the piamater through the cribriform plate of the ethmoid and with the ophthalmic veins through the orbital wall. The spongy tissue of the nasal mucus membrane is well adapted for this safety valve action. Blood can be abstracted almost directly from the intracranial circulation by means of the emissary veins which communicate between the sinuses inside the skull and the veins external to it. This is why epistaxis in children frequently relieves severe headache, the blood which flows from the nose being partly derived from the superior longitudinal sinus by means of the vein passing through the foramen caecum. It relieves ocular congestion, the result of eye strain, in the same way. The swelling up of the nasal mucus membrane may cause pressure on terminal nerve filaments, and headache. If the spongy tissue be unable to perform its function properly, backward pressure takes place and congestive glaucoma cerebral or ocular hemorrhage may occur. A feeling of fullness in the head, throbbing of the temporal arteries, eye strain and headache generally go together. On examining the eyes working under a strain the optic discs are found to be congested and the veins dilated. The safety valve of the nasal mucus membrane is thus more active in a case with eye strain.

Headache may result from eye, ear, nose or teeth troubles, but as the eyes are functionally the more active and have got work of a very complicated nature to perform, strain there is more often responsible for headache. After eye, ear, nose and dental operations a temporary neuralgia is quite common and it is referred to the head; the patient as a rule does not complain of pain at the seat of operation. One can artificially produce headache by pressing with the point of a pencil on any point of the nasal mucus membrane. We have noticed that when two surfaces of nasal mucus membrane press against each other, there is no headache as a rule, even though there is severe blocking of the nose, but, when a point of bone presses against another bone or cartilage, headache is the result and an amputation of their point relieves the headache. It appears to be more desirable to treat headache by removing the

causes of intraocular or cerebral congestion than by an intranasal operation because the latter may interfere with the safety valve action of the mucus membrane, though a submucous resection of the nasal septum or an amputation of a small piece of a turbinal does not matter.

The relationship of eye strain to what is called the lymphatic temperament is seen daily among our patients, especially in children where adenoids, tonsils, running from the nose, deformed teeth and recurrent attacks of conjunctivitis are often found to go together. Adenoids cause a poor development of the whole face and orbit and lay the foundation for many troubles in these regions in after life. Removal of tonsils and adenoids is known to cure conjunctivitis also. In the same way local applications of menthol to nose and throat have a good effect on the eyes. It is impossible to disassociate these organs from one another; generally trouble in one causes trouble in the other also, and so a vicious circle is formed and action and reaction make the conditions worse. Below will be found a case where severe photophobia was successfully treated by a nose operation and another of a European patient whose antrum of Highmore was opened up in England by a nose specialist and whose teeth were stopped by a dentist to relieve his headache but without success. On examining him here he was found to have a high degree of vertical imbalance which accounted not only for his headaches but also for the frequent attacks of nasal catarrh from which he used to suffer.

Inflammation of the mucus lining of the accessory sinuses of the nose also causes severe headache and even optic neuritis, but this is a complication of nasal catarrh which is in many cases the result of eye strain and hyperplasia of the nasal mucus membrane. If the cause of the headache is found to be in the teeth they must certainly be attended to. One has to investigate the functions of all these organs to discover the actual cause of headache.

Neurasthenia, Hysteria, Sexual Impotence, Etc.

Ernest Clarke says: "It has not been sufficiently recognized that in a large majority of those cases called neurasthenia the real trouble is a constant 'nerve leakage' or waste of nervous energy and in a large number of cases eye strain is the cause." We agree with him but would like to add that in some cases this nerve leakage takes place in the nose also. We had occasion to operate with this idea in view on a patient who had very marked S-shaped deflection of the nasal septum. The nose was blocked to a great extent so that the

patient had to breathe through his mouth and was in great discomfort, but his chief complaint was sexual impotence. Submucous resection of the septum was performed and the patient wrote subsequently that he was cured of his chief trouble, was more intelligent and energetic than before, in fact his whole character had changed. There may be some other places also in the body besides the eyes and nose where nerve leakage may occur. It is easy to understand how eye strain can cause neurasthenia and hysteria but difficult to conceive how neurasthenia, which is "a convenient cloak for failure to investigate a case sufficiently," can cause eye strain as stated by Fuchs and Mayeda of Nagoya, Japan.

In India there is a great field for refraction work as thousands of cases of eye strain even amongst those who can afford to buy glasses remain untreated. They themselves think that so long as they can see all right there is nothing wrong with their eyes and they have not been advised on the subject of glasses.

We asked the Head Master of a local school to send us a list of school boys who could not see the blackboard and who always took the front seat on that account or who exhibited symptoms of eye strain in any way, and we received a list of about 150 such boys. We are certain that in some of the big cities of India several refractionists could be kept busy all the year round with school boys alone. Office clerks are no better off in this respect than school boys. A systematic examination of the eyes and throats of school children by properly trained men would be a great gain to the younger generation. Results obtained by a general practitioner who has got a hundred other things besides refraction to do cannot be reliable. We have to thank Sub-assistant Surgeon Hukam Chand for the assistance he has given us in performing Retinoscopy.

Cases of glaucoma on which retinoscopy was done either with or without iridectomy. P. L. stands for perception of light.

Mr. C., 50 years, H. M., 8-5-15.—Chronic, simple glaucoma in both eyes, was partly deaf. Had discharge from ears all his life.—R.E.+5D. cyl. axis 30 down and in. L.E.+5D. cyl. axis 20 down and in. Had 1.5D. of right hyperphoria.

K. S. I. A., 64 years, M. M., 13-5-15.—Right eye glaucoma, no perception of light. History of headaches. Middle turbinals pressing on the septum both sides. L.E. retinoscopy was done. V. without glasses=6/36.—L.E.+1.5D. sph.=—.5D. cyl. axis 90. V.=6/.

Mr. M. L., 69 years, H. M., 9-9-15.—V without glasses, 6/36 R.E.

L.E. no perception of light. Trephining done with iridectomy, and retinoscopy later on.—R.E.=.5D, sph.=—.2D. cyl. axis, 90 V. 6/6.

Mr. M. F., 50 years, M. M., 6-10-15.—Glaucoma R.E. V. without glasses 6/18. Trephining with iridectomy done. No retinoscopy performed.—+1.25D. sph. V. 6/5.

Mrs. R. N., 50 years, H. F., 7-10-15.—Glaucomatous cataract both eyes. Left eye no P.L. Right eye P.L. present. Trephining done both eyes with iridectomy. Retinoscopy performed R.E.—R.E.—2.5D. sph.=—1.75D. cyl. axis 90 V. could count fingers at a distance of 3 yards.

Mrs. S. B., 23-10-15.—History of having pains in the eye p P.L. Pupil L.E. dilated. Reaction sluggish to light. V. R.E.=6/10. V. L.E. 6/12.—R.E.+ .5D. cyl. axis 170 down and out. L.E.+ .75D. cyl. axis 90. V. each eye 6/6.

Mr G. M., 50 years, M. M., 13-11-15.—Chronic simple glaucoma both eyes. Advised trephining with iridectomy. Not operated on. Retinoscopy performed. V. each eye without glasses 6/60.—R.E.+ 2D sph combined with +1D. cyl. axis 150 down and out. L.E.+1D. sph.=+.5D. cyl. axis 180. V. each eye 6/9.

Mr. B. D., 4-12-15.—R.E. glaucoma. Distinct cupping and atrophy of the optic disc seen. Media clear. Shadow test could be easily done. Iridectomy already done. Retinoscopy performed. No perception of light.—R.E.—5D. cyl. axis 135 Down and out. No vision.

Mrs. B. P., 60 years, H. F., 23-2-16.—Chronic simple glaucoma both eyes. Advised iridectomy. V. without glasses in each eye 6/60. Retinoscopy performed. R.E.+3.5D. sph.=+5D. cyl. axis 30 down and in. L.E.+4.5D. sph.+5D. cyl. axis 30 down and in. V. R. 6/8. V. L. 6/12.

Mrs. M. H., 50 years, M. M., 17-3-16.—Glaucoma right. Irirdec-tomy done and retinoscopy performed. V. R.E. 6/60. L.E. no P.L. R.E.—1.5D. cyl. axis 99. V.=6/10.

K. S. H. S., 45 years, M. F., 2-4-16.—Chronic simple glaucoma, distinct cupping of left optic disc. Cupping right eye shallow. V. R. without glasses 6/40. L. 6/60. Retinoscopy performed. Iridectomy was done in left eye in some hospital. R.E. .25D. sph.=+1D. cyl. axis 35 down and in. L.E.—1.25D. cyl. axis 130 down and out. V. each eye=6/8.

Mrs. C., 59 years, H. F., 25-4-16.—L.E. optic disc cupped and seen through a mist. Iridectomy was done at Lucknow. R.E. no P.L. Retinoscopy performed on L.E.. L.E. V. without glasses 6/40. —L.E.—.5D. sph.=+3.5D. cyl. axis 180. V.=6/10.

Cases in which lens was seen to be quite opaque to reflected light and partly to transmitted light, details of fundus could hardly be seen but shadow test was easily done and sight improved with glasses.

Mr. J. L., 36 years, H. M., 29-6-15.—The opacity in the lens had not markedly increased during the last several years.—R.E.—19D. sph. L.E.—15.5D. sph.—5.5D. cyl. axis 130 down and out.

Mr. A. M., 62 years, M. M., 24-8-15.—Had slight opacity in the lens both sides. V. R.E.=3/60. V. L.E.=6/12.—R.E.—4D. sph.=1D. cyl. axis 90 L.E.—1.5D. sph. V. R. 6/9 L. 6/6.

Mr. G. B. S., 58 years, H. M., 24-12-15.—L.E. no P.L. R.E. lens seen opaque as described above. V. R. 5/60. L. do.—R.E.—9D. sph.—5D. cyl. axis 90. V. 6/12.

Mr. G. P., 62 years, H. M., 14-2-16.—V. R.E.=1/2/60. V. L.E.=1/60. Lense partially opaque in both eyes.—R.E.—5.5D. sph.—5D. cyl. axis 90 L.E.—6D. sph.—5D. cyl. axis 90. V. each eye 6/12.

Mr. G. A., 50 years, M. M., 25-3-16.—Lens was partly opaque in left eye. Rich eye operated on for cataract.—L.E.+7.5D. sphr.=+1.5D. cyl. axis 140 down and out. V. without glasses 6/36. V. with glasses 6/6.

Some of the cases of cataract which were operated on by preliminary conjunctiva flap operation upward extraction, generally with iridectomy, on whom retinoscopy was done and results obtained as mentioned below.

Mr. A. B., 24-1-15.—Aphakia left eye. This case could be mistaken for detachment of retina but retinoscopy showed high corneal astigmatism due to prolapse of a knuckle of iris. Retinoscopy was done at half metre.—R.E. plane. L.E.+3D. sph.=+12D. cyl. axis 180. V. 6/9 partial. With near glasses could read ordinary print well.

Mr. L. S. M., 28-1-15.—Aphakia. R.E.—R.E.+11D. sph. V.=6/4.5.

Mr. M. M., 60 years, M. M., 29-1-15.—Aphakie both eyes.—R.E.+12D. sphr. L.E.+9D. sphr., 1D. cyl. axis 30 down and in. V.=6/4.5.

M. M. L., 45 years, M. F., 29-1-15.—do.—R.E.+10.25D. sphr. L.E.+9.75D. sphr.+5.25D. cyl. axis 180. V. each eye.=6/4.5.

Mr. G. H. R., 70 years, H. M., 31-1-15.—Aphakie left.—L.E.+11D. sphr.=+4.5D. cyl. axis 130 down and out. V.=6/6.

P. R. B., 70 years, M. M., 9-2-15.—Aphakie both eyes. Prolapse

of iris present left eye.—R.E.+9.5D. sphr.=+2D. cyl. axis 50 down and in. L.E.=7.5D.=+5D. cyl. axis 180. V. R. 6/4.5. L. 6/6.

Mr. S. M., 19 years, M. M., 19-4-15.—Traumatic cataract right Lens needled and washed out. Retinoscopy done at half metre.—+10D. sphr.=+2D. cyl. axis 90. Vision record missing.

Mr. T. H., 65 years, M. M., 8-5-15.—Aphakia R.E.—R.+12.5D. sph. with +3D. cyl. axis down and in. V. 6/6.

Mr. H. B. L., 53 years, H. M., 10-5-15.—Do.—R.E.+9.5D. sph.=+2.75D. cyl. axis 20 down and in. V. 6/6.

Mr. A. J., 80 years, M. M., 10-6-15.—Aphakia right.—R.E.+11D. sph.=+1.5D. **cyl. axis 10 down and in.** V.=6/6.

Mr. H. Q. U., 70 years, M. M., 2-7-15.—Aphakia right. A small prolapse also seen.—R.E.+6D. sph.=+7.5D. cyl. axis 10 down and in. V=6/9.

Mr. N. L., 65 years, M. M., 3-9-15.—Aphakia both eyes.—R.E.+9D. sph.=+3.5D. cyl. axis 60 down and in. L.E.+10D. sph.=+3.5D. cyl. axis 170 down and out. V. each eye=6/6. ?

Mr. M. D., 33 years, M. M., 29-9-15.—Aphakia R.E. after dislocated cataractous lens which was removed.—R.E.+7D. sph.+1.5D. cyl. axis 40 down and in. V.=6/10.

Mr. S. G. A., 82 years, M. M., 6-10-15.—Aphakia L.E. Opacities were found in the vitreous.—L.E.+9D. sph.=+.5D. cyl. axis 180 V. not recorded.

Mr. S. U., 63 years, 23-10-15.—Aphakia L.E.—L.E.+7D. sph.=+3D. cyl. axis 180. V.=6/6.

Mr. S. U. K., 20 years, M. M., 10-11-15.—R.E. high myopia. L.E. cataract. Lens needled and washed out. Retinoscopy at half metre.—R.E.—16D. sph.=—1D. cyl. axis 90. L.E.—2.5D. sph.=—1.5D. cyl. axis 120° down and out. V. each eye=6/24.

Mr. S. U. K., 70 years, H. M., 12-9-15.—Aphakia left.—L.E.+10.5D. sph.+5D. cyl. axis 40 down and in. V.=6/6.

Mrs. P., 70 years, H. F., 14-11-15.—Do.—L.E.+6.5D. sph.=+2.5D. cyl. axis 50 down and in. V.=6/8.

M. N. D., 55 years, H. M., 6-2-15.—Do.—L.E.+11.5D.=+.25D. cyl. axis 180. V.=6/8.

Mr. P., 45 years, O. M., 17-12-15.—Do.—L.E.+11.5D. sph.=+1.75D. cyl. axis 180. V.=6/6.

Mr. O. P., 66 years, H. M., 17-12-15.—Aphakia both eyes.—R.E.+9.5D. sph.=+2D. cyl. axis 180 D.E.+10.5D. sph.=+2D. cyl. axis 30 down and in. V. R.=6/9. L.=6/30. The diminution of vision in both eyes is due to pain which he got a month after the operation.

Mr. M. N. M., 37 years, H. M., 28-12-15.—Aphakia R.—R.E. + 12D. sph.=+5D. cyl. axis 40 down and in. V.=6°4.

Mr. J. R. D., 60 years, H. M., 28-1-16.—Aphakia both eyes.—R.E.+10D. sph.=+1D. syl. axis 180. L.E.+11D. sph.=+2D. cyl. axis 180. V. R.=6/6. V. L.=6/8.

Mr. M. C., 45 years, H. M., 22-2-16.—Aphakia both eyes.—R.E. +105D. sph.=+.5D. cyl. axis 180. L.E. +9D. sph. =+3.5D. cyl. axis 10 down and in. V.=6°6 each eye.

Mrs. T. K. M., 60 years, H. F., 22-2-16.—Aphakia R. E.—R.E. +8D. sph.=+5.5D. cyl. axis 10 down and in. V.=6/15.

P. C. L., 53 years, H. M., 25-2-16.—Do L. E.—R.E. plane. L.E. +11.5D. sph.=+.5D. cyl. axis 70 down and in. V.=6/6.

C. E., 23 years, H. F., 25-2-16.—Aphakia. Lens needled washed out and retinoscopy at half metre. R.E.+10D. sph.+5D. cyl. axis 180. L.E.+11D. sph. V. each eye=6/6.

Mr. A. K., 48 years, M. M., 1-3-16.—Aphakia R. E. Prolapsed iris present. R.E.+3D. sph.==9D. cyl. axis 25 down and in. V.=6/12.

Mr. S. H., 60 years, M. M., 25-3-16. Aphakia L. E.—L.E. + 10D. sph.=+1D. cyl. axis 160 down and out. V.=6/6.

Mr. M. R., 50 years, H. M., do.—Aphakia R. E.—R.E.+11.5D. sph.=+1.75 cyl. axis 10 down and in. V.=6/6.

Mr. S. L., 70 years, H. M., 31-3-16.—Aphakia R. E.—R.E. + 8D. sph.=+4.5D. cyl. axis 45 down and in. V.=6/6.

Mr. D., 70 years, H. F., 1-4-16.—R. E. operated at this hospital. L. E. at Kathiawar. R.E.+11D. sph.=+2D. cyl. axis 35 down and in. L.E.+12D. sph. V. R. E.=6/5.

Miss P. T., 60 years, H. F., 16-4-16.—Left aphakia.—L.E. + 9D. sph.=+4D. cyl. axis 180. V.=6/8.

Mr. B. B. S., 37 years, H. M., 26-4-16.—Aphakia Rt.—R.E. + 9D. sph.=+3D. cyl. 35 down and in. V.=6/6.

Mrs. R., 70 years, O. F., 13-5-16.—Aphakia left.—L.E.+10.5D. sph.=+2D. cyl. axis 180. V.=6/5.

Mr. G. A., 50 years, M. M., 25-3-16.—Aphakia right.—R.E. + 11D. sph. =+1D. cyl. axis 160 down and out. V.=6/8.

Retinoscopy on some of the cases operated on for cataract in other hospitals, and who came to this hospital for glasses.

Mr. L. D. D., 68 years, H. M., 21-4-15.—Operated for cataract entire removal of the lens. Corneal incision.—R.E.+9D. sph.=+7D. cyl. axis 180. Vision with glasses 2/60.

P. D., 2-6-15.—Operated 6 years ago on R. E.—+10D. sph.=+1D. cyl. axis 40 down and in. L.E.—.5D. cyl. axis 170 down and

out. Vision 6/6. Has got 3^{Δ} of static and 11^{Δ} of dynamic esophoria.

G. D., 3-6-15.—Aphakia. Was using +10D. sph. and could not find her way about. Lens removed entire. Corneal incision. Retinoscopy done.—+12D. sph.=+3D. cyl. axis 180. V.=6/18.

Mr. M. B., 50 years, M. M., not examined here.—Operated on by Colonel Smith. Had a prescription for glasses signed by him.—+10D. sph.=+3.5D. cyl. axis 180.

Mr. R. C., 65 years, H. M., 10-11-15.—Aphakia. Was operated at Mogha. Has got high degree of cyclophoria, and 2 degrees of static esophoria and 2 degrees of left static hyperphoria.—+9D. sph.=+1D. cyl. axis 150 down and out. V.=6/6.

Mr. B. S., 50 years, H. M., 30-12-15.—Was operated by Col. Smith. Was wearing +10D. sph. as given by him.—+6.5D. sph.=+3D. cyl. axis 180. V.=6/6.

Mrs. P. H., 45 years, E. F., 12-1-16.—Operated by Col. Smith. A small prolapse near the outer angle R. E. Retinoscopy done.—R.E.+13.5D. sph.=+1.5D. cyl. axis 130 down and out. V.=6/6. Same power as right eye, axis 140 down and out. V.=6/6.

Mr. H. A. H., 82 years, M. M., 1-4-16.—Entire removal of the lens. Corneal incision. Wearing +11D. sph. Retinoscopy performed.—R.E.+7.5D. sph.=+2.5D. cyl. axis 40 down and in. L.E.+9D. sph.=+1.5D. cyl. axis 170 down and out. V. each eye=6/8.

L. B. D., 60 years, H. M., 4-12-15.—L. E. aphakia. R. E. glaucoma. L. E. lens removed entire by corneal incision.—L.E.+10D. sph.=+3D. cyl. axis 180. V.=6/12.

Cases of trachoma, corneal opacity and trichiasis and other forms of conjunctivitis, etc., who were treated with caustics before and were given glasses to relieve the eye strain in this hospital.

Mrs. K. B., 20 years, H. F., 13-8-14.—Trachoma.—R.E.+1D. cyl. axis 90. L.E.+2.5D. sph.=+1D. cyl. axis 90.

Mr. M. S., 25 years, H. M., 5-2-15.—Corneal opacity and trachoma.—R.E.—.5D. sph.=—3.75D. cyl. axis 170 down and out. L.E.—1D. sph.=—4.5D. cyl. axis 40 down and in.

Mrs. C. P., 18 years, H. F., 15-3-15.—Trachoma.—R.E.+1.25D. sph.=—5.9D. cyl. axis 170 down and out. L.E.+1D. sph.=—6.5D. cyl. axis 170 down and out.

B. F., 18 years, H. F., 1-4-15.—Trachoma and adenoids present.—R.E.—1D. sph.=+4D. cyl. axis 110 down and out. L.E.—1.5D. sph.=+3.75D. cyl. axis 110 down and out.

Mr. P. B., 26 years, H. M., 3-4-15.—Phlyctenular conjunctivitis.

—R.E.—1D.=+1.5D. cyl. axis 150 down and out. L.E.—1.25D. cyl. axis 60 down and in.

Mr. F. D., 40 years, M. M., 10-4-15.—Trachoma.—R.E.—1.5D. sph.=—1.5D. cyl. axis 90. L.E.—1.5D. sph.=—1.25D. cyl. axis 90.

Mr. A. R., 20 years, M. M., 17-4-15.—Trachoma.—R.E.+3.75D. sph.=+.25D. cyl. axis 40 down and in. L.E.+6.25D. sph.=+.25D. cyl. axis 180.

Mr. R. S., 23 years, H. M., 9-5-15.—Keratitis and trachoma.—R.E.—3D. cyl. axis 180. L.E.—5D. cyl. axis 180.

Mr. A. A., 46 years, M. M., 19-5-15.—Trachoma.—R.E.+25D. sph. L.E.+4.5D. sph.=+2D. cyl. axis 90. C. 2 Δ apex down R. E.

Mr. F. C., 20 years, H. M., 23-6-15.—Trachoma, corneal opacity and faceted cornea.—R.E.+25D. sph.—5.25D. cyl. axis 180. L.E.—4D. sph.=—3.5D. cyl. axis 90.

Mr. A. A., 38 years, M. M., 15-7-14.—Had trachoma, was operated on for trichiasis. Corneal opacity present as well. Retinoscopy was done. R.E.—1Dd sph.=+5D. cyl. axis 90. L.E.—1D. sph.=+4.5D. cyl. axis 90. His condition much improved with the glasses.

Mr. M. A., 40 years, M. M., 21-5-15.—Trachoma. Faceted cornea and corneal opacity.—R.E.+1D. sph.=+.75D. cyl. axis 30 down and in. L.E.+75D. cyl. axis 30 down and in.

Mr. A. L., 42 years, M. M., 26-5-15.—Trachoma and corneal opacity. R.E.—R.E.+3D. sph.=+.5D. cyl. axis 180. L.E. plane as he had traumatic cataract.

Mr. N. D., 30 years, H. M., 9-6-15.—Corneal opacity and trachoma both eyes.—R.E.+25D. sph.=+.75D. cyl. axis 40 down and in. L.E.+75D. sph.=+.75D. cyl. axis 30 down and in.

Mr. A. A., 23 years, H. M., 10-16-15.—Do.— —3D. sph.=+4D. cyl. axis 80 down and in. L.E.—5D. sph.=+6D. cyl. axis 70 down and in.

Mr. H. H., 25 years, M. M., 11-6-15.—Do.— —R.E.—1D. sph.=—1D. cyl. axis 90. L.E.—6D. sph.=—5D. cyl. axis 90.

Mr. D. D., 26 years, H. M., 10-7-15.—Do.—R.E.—.25D. sph.=+.75D. cyl. axis 180. L.E.—.25D. sph.=+.5D. cyl. axis 180.

Mr. H. C. B., 45 years, E. M., 15-7-15.—Old blephritis.—R.E.+5D. cyl. axis 180. L.E.+5D. cyl. axis 180.

Mrs. S. P., 32 years, H. F., 29-7-15.—Corneal opacity and trachoma.—R.E.—.5D. sph.=—2D. cyl. axis 120 down and out. L.E.—2.75D. sph.=—4.5D. cyl. axis 103 down and out.

Mr. S. N., 48 years, H. M., 12-7-15.—Trachoma faceted cornea and corneal opacity both eyes.—R.E.+75D. sph.=+1D. cyl. axis 180. L.E.—.75D. sph.=+2D. cyl. axis 180.

Mr. R. C., 16 years, H. M., 21-10-15.—Spring catarrh.—R.E.—.5D. sph.—.5D. cyl. axis 180. L.E.—.5D. sph.=+.75D. cyl. axis 30 down and in

S. S., 9 years, M. F., 3-11-15.—Trachoma and keratitis. Retinoscopy done after treating keratitis. R.E.+2D. sph.=+1D. cyl. axis 180. L.E. +2D. sph.

Mr. B. N. S., 40 years, H. M., 5-11-15.—Trachoma.—R.E.—.5D. sph.=+1.25D. cyl. axis 60 down and in. L.E.—.5D. sph.—1D. cyl. axis 90.

Mr. G. I. G., 41 years, E. M., 18-11-15.—Winking of the eyes and watering.—R.E.—.25D. cyl. axis 165 down and out. L.E.—.25D. cyl. axis 180.

Mr. S. B., 30 years, H. M., 30-12-15.—Corneal opacity and trachoma.—R.E.—2.5D. cyl. axis 145 down and out. L.E.+1D. sph.=—3D. cyl. axis 170 down and out.

Mr. M. S., 31 years, H. M., 27-2-16.—Trachoma and trichiasis for which an operation was done as well.R.E.—7D. sph.=—1.5D. cyl. axis 70 down and in. L.E.—6.5D. sph.+—1.5D. cyl. axis 90.

Mrs. Singh., 50 years, O. F., 12-4-16.—Trachoma, was operated on for trichiasis.—R.E.+5D. sph.=+1.5D. cyl. axis 90. L.E.+4D. sph.=+1.5D. cyl. axis 90.

Cases of Headache Due to Eye Strain Relieved by Glasses

Mr. S. S., 40 years, H. M., 19-6-14.—Headache and evidence of old syphilitic iritis in the right eye.—Right eye —4D. sph.=+5D. cyl. axis 160D. and out.

Miss K. F., 36 years, H. F., 27-11-14.—Frontal headache conjunctivitis.—R.E.—1.25D. sph.=—1D. cyl. axis 150D. and out. L.E.+25D. sph.=—1D. cyl. axis 30D. and in.

Mrs. A. E. W., 32 years, E. F., 12-12-14.—Headache relieved by —L.E. 1 Δ apex up.

C. J. H., 40 years, E. M., 22-10-15.—Headache cyclophoria. Finds difficulty in coming downstairs.—R.E.+3D. sph.=+.75D. cyl. axis 170D. and out. L.E.+2.25D. sph.=+1D. cyl. axis 80D. and in combined 1 Δ apex up R.E. and 1 Δ apex down left.

Miss S., 28 years, E. F., 7-2-16.—Headache relieved by—R.E.+ .5D. sph.=+.25D. cyl. axis 45D. and in.L.E. +.25D. sph.=+.25D. cyl. axis 60D. and in.

Mr. S. G. N., 60 years, E. M., 29-2-15.—Frontal headache after office work. Muscular imbalance 2 Δ of L. dynamic and static hyperphoria.—R.E.+ .75D. sph. L.E. plane. This did not relieve the

headache but in addition of 2 Δ apex up L.E. completely relieved the headache.

Mr. R. H. S., 47 years, E. M., 15-3-16.—Headache after railway journey. Muscular imbalance 5 Δ of left static and dynamic hypophoria.—+.5D. sph.=+1D. cyl. axis 110D. and out. L.E.+5D. sph.=+.75D. cyl. axis 150D. and out. This did not relieve the headache but a combination with it of 2 Δ apex up R. E. and 2 Δ apex down L. E. relieved it.

Miss M. S., 35 years, E. F., 10-4-16.—Severe frontal headache relieved by—.Stationary opacitic in the lens all around near the equator.—R.E.+4.5D: sph.=+2D. cyl. axis 90. L.E.+3.5D. sph. with+1.75D. cyl. axis 105D. and out.

Mrs. A. K., 62 years, M. F., 16-5-15.—Severe photophobia for several months. Cartilage of septum of nose deflected to right side and pressing on the middle turbinal. R.E.—.5D. cyl. axis 30 down and in. L.E.—1.25D. sph. with—.5D. cyl. axis 120 down and out. Submucous resection of septum also performed. Patient completely relieved.

F. H., 28-10-15.—Headache and watering of the eyes and giddiness. Had enlarged tonsils and adenoids.—R.E.—.25D. sph. with—.25D. cyl. axis 140 down and out. L.E.—.25D. sph. with—.25D. cyl. axis 35 down and in.

Mr. A. E. A., 61 years, E. M., 2-11-15.—Very severe sneezing fits relieved completely by—R.E.+2D. sph.+1D. cyl. axis horizontal. L.E.—+2D. sph.=+1D. cyl. axis 180 combined 1 Δ apex down R. E. and 1 Δ apex up L. E.

Mr. L. M. R., 18 years, H. M., 5-1-15.—Headache. Anterior inferior tip of middle turbinal found pressing on the septum.—R.E.—1D. sph.=—5D. cyl. axis 140 down and out. L.E.—1D. sph.=—2.5D. cyl. axis 110 down and out. Amputation of the tip of turbinal relieved headache even before the glasses were worn.

Mr. R. D., 31 years, E. M., 12-1-16.—Headache and recurring nasal catarrh. Turbinectomy was performed and antrum of highmore opened in England by nose specialist. Muscular imbalance tested. Found to have right hyperphoria ranging between 2 and 6 Δ according as he took rest or did hard work in office.—R.E.—7.25D. sph. combined with—.5D. cyl. axis 110 down and out. L.E.—7D. sph.=—.5D. cyl. axis 90 was wearing glasses about the same power before examination also. Prismatic addition was also made now.

Mrs. O., 17 years, H. F., 3-2-16.—Headache and frequent nasal catarrh.—R.E.+7.5D. sph. L.E.+1D. sph.=+.25D. cyl. axis 90.

Mrs. D., 31-1-16.—Operated for a growth in nose in London some

years ago. Headache present.—R.E.+.5D. cyl. axis 130 down and out. L.E.+.25D. cyl. axis 160 down and out.

Mr. M. S. D., 23 years, H. M., 23-4-15.—Never suffered from headache.—R.E.—1.5D. sph.=+3.25D. cyl. axis 110 down and out. Left eye plane. Vision normal.

Mr. M. W. C., 37 years, E. M., 6-8-14.—Never had headache even after reading at desk for six hours. Did not wear glasses two years before examination. Good health.—R.E.+5.5D. sph. L.E.+5.5D. sph.=+1.25D. cyl. axis 120 down and out. Has been wearing +6D. sph. each eye for the last two years only.

Some cases of corneal opacity in which retinoscopy was done after iridectomy or without iridectomy.

Mr. L. R. S., 29 years, H. M., 25-10-15.—Corneal opacity iridectomy done. Retinoscopy performed.—+6D. sph.=+.75D. cyl. axis 160 down and out.

Mrs. M. D., 25 years, H. F., 9-5-14.—Evidence of old syphilitic iritis. A few detached pieces of iris on the front surface of the lens and a few dots of opacity on the posterior surface of cornea. Wassermann reaction positive ++. V. 6/60. Retinoscopy performed on this eye.

A Case of Sympathetic Ophthalmia

J. L., 13 years, M. M., 12-9-15.—Left eye disorganized. Right eye marks of sympathetic uveitis. Detached pieces of iris on the lens. History pointing to sympathetic uveitis.—V. without glasses 6/40. Retinoscopy performed.—R.E.—.75D. sph.=—1.5D. cyl. axis 180. V.=6/8.

(N. B.)—Presbyopic additions have not been shown in the prescriptions given above.

XIV.

THE CATARACT OPERATION AS DONE BY SPANISH AND LATIN-AMERICAN SURGEONS.*

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It is more easy for us to talk about this subject because of our recent trip to Spain in order to attend the annual meeting of the Spanish-American Ophthalmological Association, which was held at Valence, Spain, on September 20-23, 1916. We took an active part in the Congress because we had been honored with the reading of the official theme, which was on "the present state of cataract operation," and we gave our opinion, which was according to what we had seen in our last trip to the United States, at the end of 1915 and the beginning of 1916.

Cataract operation is today the best studied intervention of all ophthalmic surgery, and the one in which the advances made by the auxiliary sciences have had a fruitful application. As we have often said before, cataract operation is the combined result of the imaginations of two savants: first the superior mind of Daviel, who made the extraction, surrounded as he was by the backwardness of the ocular pathology of those days, and then the great imaginative genius of his colleague de Graefe, who perfected the work of his predecessor. By the two of them the foundations of the actual ophthalmologic progress were laid, and this progress was made the more solid by the discovery of local anesthesia and the findings of bacteriology. We have, therefore, arrived at a time in which any given method, for they all run inside the same circle, gives good operative results in cataract extraction. The various methods, however, offer some difficulties at times, and it is necessary to follow some procedure which in some way would guarantee that something that occurs rarely would not do so, and that thing is the herniæ of the iris, a complication that jeopardizes success in cataract operation.

At another time we said that the method which avoids these dangerous complications is the combined extraction with the conjunctival flap, and we called it the "American method," for we had seen it almost regularly done by the American surgeons in the United States. This year at the Congress held at Valence we maintained the necessity of adopting that method when one wants to have a safe result. Our views were opposed by a great many of

*Read before the twenty-first meeting of the American Academy of Ophthalmology and Oto-Laryngology, Memphis, Tennessee, December, 1916.

the colleagues who attended the Congress, but we think that in doing so they had in mind only the theoretic point of view, and not the practical difficulties that many of them had themselves found in their practice, and we know that many of those who were opposed to the method really practiced it when confronted by some difficulties.

Nobody doubts that the eye operated by the simple extraction always gives a nice after-result from an esthetic point of view, but sight is such a blessing that one can sacrifice somewhat to the esthetic if by so doing we can insure a greater degree of safety to our patient.

If we were disposed to follow each one of those opposed to our views in their daily routine practice, we are sure that we would frequently see the combined extraction done by them as well as the conjunctival flap, because that operation is the completeness or total of surety, and they would either practice a preventive iridectomy or make it at the time of the operation, especially if the patient is impatient and wants his eye operated before the lens is compact. This last thing should not be done, but many do it because if they do not, somebody else will. All this proves that they have more trust in the iridectomy and that there has not been the frankness required to confess that the combined extraction requires more skill, because the excision of the iris is not an easy operation and has some dangers from which the simple extraction is free. In the simple extraction as done by us only the knife and forceps are needed, because our assistant holds open the eyelids. Those are the only instruments that we have used and that we actually use, because in the majority of the cases it is more easy and of more effect to use only one instrument. We make the breaking of the capsule with the knife also. We cannot ignore the dangers that may occur in the simple extraction.

To make the extraction with iridectomy and conjunctival flap—that is, to make what we call the “American method of cataract extraction”—it is really necessary to be equally skilled with both hands in order to operate each eye with the corresponding hand. We have no such skill, and believe that at our old age shall not have it, but we recommend to all beginners to follow that practice in order to possess a safe method that gives good results. If we had been obliged, therefore, to make a review of the opinion of the Spanish and Latin-American oculists, we would have been obliged to say that they do not favor as a method of “guarantee” the combined extraction with the conjunctival flap. It is not necessary

to say that in recommending a procedure in medicine, more than in any other science, we should always have in mind that to each rule there are some exceptions and that there should be some adaptations to every individual case; but, all in all, we insist that an eye operated by the combined method with the conjunctival flap is more free from accidents or unexpected complications. Those may arise in the most well-made operation, and one can never tell what the result of a cataract case will be until a large number of days have passed.

We could say that the resistance offered by the Spanish and Latin-American ophthalmic surgeons is similar to that seen in some colleagues in the United States, also, who practice the simple extraction in their cases, it being hard for them to change from their usual method to another, which, although more safe, cannot be mastered until one is equally skilled with both hands.

We want to express our opinion before the profession, and it is the result of our constant actuations in the clinics and our frequently published papers on the subject, and not the fruits of imagination. To conclude, we can say that owing to the high degree the progress in cataract operation has reached, the extraction with iridectomy and conjunctival flap, which we have called the "American method," is the most safe method and the one that gives more guarantee and around which are admitted all the advances that the operative practice can determinate.

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THE "NEW OPERATION FOR CATARACT."

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An article on cataract operations by Major Corry appeared in the Indian Medical Gazette in the issue for April, 1916. This purported to be an accurate description of the operation as performed by Hari Shanker, Major Corry's assistant at Delhi, and in it the author took exception to a description of the operation as published by Colonel Henry Smith in a previous number of that journal. At rather frequent intervals thereafter joint articles by Major Corry and Hari Shanker appeared in the Indian Medical Gazette, while the latest one was published in the January number of "Ophthalmology."

In November, 1915, I had the interesting experience of witnessing Hari Shanker perform a number of his cataract operations. Both Major Corry and Hari Shanker displayed great hospitality, and I was also graciously invited to operate, which I politely declined. Under the circumstances I am very loath to enter into a discussion as to the merits or the demerits of the operation, but in view of the fact that rather numerous articles on the subject have appeared from the pens of Major Corry and Hari Shanker, and that announcement has been made that more are to follow. I now feel it incumbent upon me to say a few words concerning the operation.

At the outset I wish to emphasize the fact that Colonel Henry Smith's article in the February, 1916, issue of the Indian Medical Gazette is a very accurate description of the operation as I saw it actually performed by Hari Shanker, but in every new article published by Major Corry and Hari Shanker the operation has undergone a change and it is difficult to follow its chameleon-like metamorphoses. The operation so boastfully heralded as being endorsed by Colonel Maynard and several others has been discarded evidently and is not the same procedure that is put forth this month as the last word in cataract operations; what the operation will be next month would tax a fertile brain to anticipate.

The following extract is from my notes taken at the time of my visit to Major Corry in November, 1915:

"Visited Major Corry and Hari Shanker at the Civil Hospital. Was shown cases operated upon from twenty-four hours to fifteen days before; among them saw one case of suppuration after the

cataract operation. In all the conjunctivae were very red and edematous; corneae bruised and with very poor lustre. Some appeared like after the capsulotomy operation, the capsules seeming to have been left behind, and the pupil not black as in the intra-capsular operation.

In some the sclero-corneal incision seemed to bulge as if the wound had not united although the conjunctival flap seemed to be attached above. It appeared as if aqueous or vitreous was underneath the flap.

Uses four or five drops of twelve per cent cocaine and adrenalin dropped in the eye. No infiltration anaesthesia. Lashes and eyebrows are cut. *No irrigation; nurse-boy wipes conjunctiva with cotton moistened with ordinary tap-water, not boiled.* Smith speculum is kept in eye from beginning to end. After incision is made in conjunctiva with scissors, it is dissected down to corneal margin with the points. The lower lip of conjunctival wound is pulled down over cornea; knife is entered sub-conjunctivally at corneal margin at about half its circumference and passed across to make counter-puncture at opposite side, coming out through conjunctiva at this point; counter-puncture being used somewhat like a lever, heel of knife is carried with a sawing motion upward and toward counter-puncture until the sclero-corneal margin is cut.

After iridectomy conjunctival flap is caught with forceps and pulled away from eye and downward toward patient's feet, causing corneal wound to gape. Attempt is then made to dislocate lens by pressing with point of strabismus hook against lower portion of cornea, applying pressure above lens at same time if it does not come readily. Conjunctival opening being smaller than lens causes great difficulty in dislocating; lens has to mould very much. Iris is replaced by grasping it with forceps and pulling downward toward patient's feet. Conjunctiva is then smoothed out and eye bandaged.

Patient walks from table. If he lives at a distance Hari Shanker informed me that bandage may be removed in four hours and patient sent to his home.

Much blood in anterior chamber; capsule ruptured in half the cases seen.

Operates in open air on porch; seems very little precaution is taken against sepsis."

From the above brief notes it may be somewhat difficult to understand the method but at the time I also made rough sketches in my note book giving each step in detail.

The great merit of the operation, according to their claims made

to me, lies in "the check-ligament action of the sub-conjunctival bands," which tends to draw the conjunctiva back into position and thus help to close the wound.

The operation did not appeal enough to me from a surgical standpoint to deserve discussion; the reason for this will be easily apparent to any ophthalmologist of even limited experience who will read Colonel Smith's accurate description of Hari Shanker's operation.

In the article in the June, 1916, issue of the Indian Medical Gazette, this operation, as above described, seems to have been discarded by the authors for extraction downward; to quote:

"Downward extraction was then practiced in special cases only, but further experience has proved that downward is superior to upward extraction in many ways—the conjunctival flap can be made absolutely free, gravity will keep it in position; the *check-ligament action of the sub-conjunctival bands is not required.*"

Since the upward extraction with the conjunctival flap, for which they claimed originality, has been discarded, there remains nothing else on which to comment except the new claim for originality in the downward extraction; if, however, they will take the trouble to refer to the literature on cataract operations, they will find that Schweigger as early as 1897 performed downward extraction within the capsule, practically as described by Corry and Shanker.

AETIOLOGY AND TREATMENT OF GLAUCOMA.

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It is not the intention in this fifteen minute paper to go into the history of the symptom complex which we still call glaucoma; a history which would fit well in a text book on the subject, but not in a paper of this kind. Up to very recently in every text book on the subject, the paragraphs on the aetiology mentioned many theories on the subject, but practically all ended with the statement, "The real etiology of this disease is not known."

Physiologists and pathologists are still worrying over the question of the exact and immediate causes locally of the increase of tension in the eye. There are many conditions in which the eye has increased tension, the aetiology of which is not at all similar. For instance take the primary, chronic, insidious, increase of tension in an eye not inflamed, but which simply, quietly, unostentatiously loses vision, with no painful attacks, but light touches of loss of vision, just dim spells, and finally the case comes to the oculist for help. I have seen increase of tension in a child with a very severe attack of phlyctenular keratitis. There is an increase of tension in iritis not infrequently, the reason for which seems to be entirely obvious. The increase of tension in a chronic iridocyclo-chorioiditis of whatever origin is also entirely obvious, with or without annular posterior synechiae. The causes of increase of tension in the latter are locally quite different from the acute attacks in eyes previously noninfected or inflamed. The attention has all been directed to the local manifestations themselves, and not to the general systemic condition.

Dr. Martin Fischer in his work in oedema and nephritis shows very plainly to my mind the pathology of these cases, and that is oedema of the colloids of the eye. His theory of oedema is borne out by his experiments and the relief obtained in the treatment of oedema.

The eye, like the brain and kidney, is a closely encapsulated organ, and oedema in all are alike, and all are alike relieved by the administration of alkalies to combat the acidosis. The attacks of "uremic coma" are oedema of the brain, and prompt administration of alkalies will relieve. The same is true of acute nephritis, and alkalies relieve promptly here. I was fortunate enough to witness the most of Dr. Fischer's experiments when he was Professor of Pathology at the Oakland College of Medicine, and it was

there that we first experimented on the relief of glaucoma by injections of sodium citrate subconjunctivally, and later by administering alkalis by mouth or rectum as the exigency of the case required.

Looking for causes for increased tension in the eye, we must look to the causes of vascular disease, and when we look for the causes of vascular disease we find infection, and practically all are infection. Arterio-sclerosis is at the bottom of practically all the quiet, simple chronic glaucoma, and infection, chronic quiet infection is at the bottom of that. High blood pressure alone is not the aetiological factor, but an unpleasant accompaniment.

Syphilis plays an immense rôle in the production of arterio-sclerosis and glaucoma, and the rest would be grouped under the focal infection. Gonorrhea and tuberculosis play their rôle in the production of iritis, irido-choroiditis, and the increase of tension which may come in these cases. Some cases, as many of you have seen, may exhibit evidences of all four; a history of an old gonorrhea, syphilis on which tuberculosis is easily grafted, and as a last exciting cause a vile mouthful of decaying teeth, and a pair of infected tonsils. These are not fanciful, but real cases, and will come up very frequently. Given the chronic arterio-sclerosis, with the local spasm of the blood vessels which happens not infrequently, and we have the local setting for acidosis, and oedema of the eyeball; the increase of tension which we call glaucoma.

Focal infection has attracted enormous attention in the last four years, owing to the brilliant work of Rosenow and Billings, and recognition of these conditions has very nearly transformed our actiological studies in all branches. Recognition of these sources of infection has cleared hundreds of thousands of other clouded diagnoses, and relieved their victims of complaints of years' standing. It is so with the eyes; from simple attacks of conjunctivitis, to the sum of all infamy in the list of eye diseases, increased intra-ocular tension, or as you will, glaucoma.

Now let us consider a few cases:

Mrs. V. L. W. M., colored, age 28, occupation, maid. She came to our clinic April 8, 1916, complaining of a film over the right eye, for the past two weeks. Had suffered considerable pain. On examination, found the right cornea hazy, pupil reacting to light sluggishly, and small. Other media clear enough to see the fundus showing a cupping of the disc. Veins engorged, tension plus 1.

Very little history can be elicited, except that she has two children living, one died at five days, and has had one miscarriage.

Had about a dozen old diseased fangs. She was sent to the dentist to have the old roots extracted, given eserine to use in the eye; sodium carbonate and chloride internally. May 1st given French tincture of iodine in milk. May 23rd she was started on iodipin injections, 10 cc. every other day. I next saw the patient June 7, 1916. The worst teeth had been extracted, pupil normal in size, cornea showed numerous deposits on the posterior surface, tension absolutely normal, and pain had all disappeared.

M. R. G., contracting painter, age 66, had lost right eye thirty years before from an accident. He came to my office on his business and during the business talk said he had had trouble in getting glasses fitted and remarked that his opinion of oculists was not much higher than my then opinion of painters. I remarked when noticing that he had considerable irritation and lacrimation in the left eye, and that he had over 20 teeth all gold crowned, and gums diseased, that he was going to lose the left eye too. This scared him and he wanted to know the reasons. I explained about the danger of infection and showed the condition of the eye then. He immediately started for the extracting dentist to have them all out. The dentist was out and I did not see the patient for three months when he came to the office in great excitement with a beautiful example of glaucoma; tension about plus 3, steamy cornea, and of course very dim vision. We immediately went to the dentist who promptly gave him gas and oxygen and removed all his teeth. He went home before I saw him again but I sent for him and he appeared about three hours after the extraction operation. All the tension had disappeared, not from the extraction, of course, but at any rate it was practically normal. I put him at once on sodium carbonate 7 grs., sodium chloride 5 grs. in a large glass of orangeade, t. i. d. and sodium bicarbonate enemata, two tablespoonfuls of sod. bicarbonate to two quarts of hot water morning and evening. Eserine to keep the pupil down. The tension has only shown a tendency to rise twice since and then of a very transient character, and had disappeared before he got to the office. These came when he had slacked off in his treatment by the alkalies and especially the enemata which he naturally detested. Last week he had a little suspicious dimming which I could not detect; when he has a "ptomaine poisoning attack. Vision persists at 20/15 with his correcting lens, cyl.—75 ax. 90. Field of vision for motion perfect, color fields contracted. There is a cupping of the disc and the man is getting along well. He gained over twenty pounds while he was without teeth for three months, and living on liquid diet.

As I write the history, May 7, 1917, the tension is absolutely normal, and, so far as I can see, will remain so. He feels and acts as a well-put-up man of 45 to 50.

3. Man, age 40, came to the office with a typical quiet increase of tension, vision down to 20/40, tension plus 1, blood pressure 175. I could get no aetiology at the time, and referred him to his family physician for examination and treatment. I got no aetiology from the family physician as he was not the kind to go after it. I recommended the alkaline treatment which he got, also eserine locally, and the physician gave him iodine of potassium. A week later the patient came for examination. I found vision normal, tension normal, blood pressure normal. I have not seen the man since.

J. M., druggist, age 63, called me to see him in August, 1916. He had been on a long auto trip and had come home with very much blurred vision which he had laid to the wind and dust. This was about seventy-two hours after his return and I found the eyes hard, pupils dilated somewhat, and vision which I could not estimate on his sleeping porch, probably about 20/100. He was under the care of his family physician for his general condition, and I was merely called in to see him because he could not see very well. The tension was about plus two or possibly less. He was put at once on alkalies, eserine locally, and was able to come to the office in a few days for more direct examination. He had a high blood pressure which he had had for several years. Has both frontal and maxillary sinuses affected for twenty years, and I had years ago removed most of his middle turbinates and all the ethmoid cells that I could with local anaesthetic, and the more radical operation had been refused because his physicians refused to let him have a general anaesthetic. The discharge from the sinuses is constant. The eye condition was relieved promptly, the tension coming down to normal, and the vision has improved to 20/20 easily. The eyes are at the present writing, May 1, as soft as a young parent's, and the only difficulty at present is his reading. The visual field is normal but the color field is contracted. At first his reading was limited to words of three or four letters, but this has gradually increased until he can read long words, but goes at it slowly as a beginner or child. I finally regarded this as much mental as ocular, as the man is losing ground physically daily, had to retire from business, as he could no longer conduct it. He would fall down unconscious every little while, and his memory is failing.

Case 5.

I was called to a local sanatorium for mental and nervous diseases to see a mental case just brought in who was blind. She had a terrific double glaucoma, stony hard, pupils dilated widely. Eserine had no effect. She was in a state of semi-coma, semi-delirium, and strapped to the bed. Oedema of the brain was the diagnosis. Fischer's solution was administered per Murphy drip, and the next morning the brain symptoms were gone, and the eyes were softer, the eserine then being allowed to do its work which it could not do before, owing to the great tension and stasis. This was a known case of syphilis, and had been in a faith healing establishment for some months, where glaucoma and syphilis do not count as entities. The case improved sufficiently from this attack as to be docile and tractable and later was removed to a state hospital for the insane.

I have detailed these few cases simply to show the difference in a pathological condition and antecedent to the increasing tension of the eyes and they are fair samples of this disease we call glaucoma. I have not operated a case for five years and have many more cases than I have reported here. That does not say, however, that I will not operate next week if the occasion comes up, but it has simply been my desire to add a little contribution to this subject on the non-operative side.

As to operative or non-operative treatment: I want it understood clearly that by my statements I do not mean for a minute that we can discard operations for glaucoma. There are sudden and intense attacks that are fulminating in character, and no time can be lost, and the operation of choice should be done. What I do contend, however, is that if these cases are seen in time and in nearly all are so seen, that general medical treatment, with the eliminating of the aetiological causes, will cure and relieve without operation. I oppose operation on every case that comes up the same as I would oppose decompression operation on every case of odema of the brain. Decompression would relieve the brain symptoms, but it would not cure the case for the pathology is still left.

Operations for the relief of glaucoma do not cure glaucoma, but only relieve, as the number and variety of operations attest. While the new vessels and fresh circulation are active, the eye is relieved, but so soon as contraction has taken place, simply the absence of the piece of iris, or a leakhole somewhere is not sufficient to keep down the tension. The causes at work originally are still there, and when the leakhole no longer leaks, tension comes on again, and the

eye goes blind. I have seen very few eyes that had been operated on any great length of time that retained the vision to any great extent; in fact, the most I have seen are blind. Now what is the answer? Operate? Yes, in emergency, and then combat the original cause. Suppose there is present a large amount of focal infection around teeth or tonsils or as a result of previous infection, or there is a chronic intestinal infection, appendix or gall bladder infection, or what not. Then what becomes of the case? A quiet iritis follows, and the case is lost. As for me, I prefer to relieve the tension by medical means first, alkalies, eserine, dionin, etc., and then go after the teeth, tonsils, or whatever the aetiology may be and treat the patient as well as the eye. Then if one is still nervous about the case, let him operate, and there will not be the danger of the quiet infection undoing the work so conscientiously done. I refuse to operate on any eye for cataract while there is any focal infection. When these cases come to the clinic for operation I first find out all the conditions, teeth, tonsils, general systemic condition, and then, and then only, will I consent to operate. I did what I thought was a perfect cataract operation a few years ago, and to my disgust and amazement, a month later the eye took on a quiet iritis, and went on calmly to destruction so far as being an organ of sight was concerned. I then found out that the old lady had several old fangs of teeth that were literally swimming in pus. It served me right, and that mistake will not be repeated.

Increase of tension in the eye cannot come out of a clear sky; it must have a pathology behind it, and we certainly can elicit that pathology if we search for it. Having found it, I believe we can cure our cases if we treat the patient and eliminate the cause, and the operations will of necessity be fewer.

PATHOLOGY OF GLAUCOMA.

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(Read before the Milwaukee Oto-Ophthalmic Society February 20, 1917)

In the just published Third Annual Report of the Ophthalmic Section of the Department of Public Health in Egypt, by A. F. MacCallan, instead of 1.6 per cent of the regular statistics, 2.3 per cent among the patients seen in the Ophthalmic Hospitals in Egypt are said to suffer from glaucoma simplex, the small cornea of the Egyptians being supposed to predispose the eye to glaucoma. This is in accordance with the observations of Priestley Smith, who found the cornea, as a rule, smaller in glaucomatous eyes (at an average 11.1 mm. horizontally, 10.3 mm. vertically, against 11.6 mm. horizontally and 11 mm. vertically), than in non-glaucomatous eyes. Smith assumes that the smallness of the cornea predisposes to glaucoma by the diminution of the perilenticular space through the resulting changes of position of the ciliary body.

The alterations of the *cornea* itself are caused by congestion or inflammation or both, and appear as edema due to increased transudation from the marginal vascular loops, subepithelial infiltration with lymphocytes, new formation of connective tissue and blood vessels, producing pannus glaucomatosus. Alt. (Centralbl f. Aug., 1913, 217), found a glaucomatous pannus of the upper half of the cornea of half the thickness of the cornea, consisting of dense connective tissue with numerous blood vessels over Bowman's membrane, farther downward formation of blebs between the epithelium and the intact Bowman's membrane. As Fuchs showed, the edema of the superficial layers of the cornea may extend through the canals of the nerves penetrating Bowman's membrane under the epithelial covering and lift it up in form of blebs leading to keratitis bullosa. Besides cones of epithelial cells propagated into the new formed pannous membrane, nests of separated epithelial cells were found in it. They form the anatomical base for the small white spots, which may occasionally be noticed on the living cornea.

Descemet's membrane may show deposits containing albumen and fibrin, leucocytes and pigment. In hydrophthalmus the cornea is generally thinned, the opaque epithelium separated from it by fluid, and Descemet's membrane ruptured in consequence of hypertension, frequently showing pigment inclosures. They were first described by Haab who utilized them as differential diagnostic signs from megalocornea and cornea globosa. Recent investigations

by Stähli, (Archiv f. Aug. 79, 141), revealed that the ribbon shaped opacities are due to ruptures of Descemet's membrane and occur in more than three-fourths of all hydrophthalmic eyes. Hence they are a most valuable diagnostic sign of infantile glaucoma in later life, and the central opacities are a very important, so far neglected, element for the impairment of central vision, which Stähli found reduced at one-half or one-third. The ruptures are gaping by the receding edges and later filled with hyaloid substance from the endothelium and endothelogenous tissue from proliferation of the endothelia. These increase in number and form a massy cellular tissue with fine fibrillar and granular intercellular substance which is subject to secondary shrinking. Frequently the endothelia contain pigment from the ciliary body or iris.

In consequence of the increased tension the *sclera* shows general atrophy and subsequent diminution of elasticity. At the places of transit of the vessels cellular infiltrations of the vascular sheaths and the surrounding parts of the sclera have been observed. Heerfordt, (38 Ophth. Society, Heidelberg, 123, and von Graefe's Archiv, 83, 149), found in three eyes, affected with inflammatory glaucoma, the part of the wall of the scleral canal lying toward the sinus of the vortex veins intercepted by the blood current and bent into the opening of the scleral canal, so that it obstructed the blood passage like a valve. He calls this part the *sinoscleral plate* and considers its formation as etiological factor in hemostatic glaucoma. Accordingly, a congenital predisposition to acute inflammatory glaucoma consists in the thinness of this plate in connection with ectasia of the scleral canal, so that it can be easily mobilized. The predisposition may be acquired by laxity of the chorioid, which makes a receding or superposition of the sinus possible. Congenital predisposition to chronic inflammatory glaucoma consists partly in predisposition to lymphostatic glaucoma, partly in congenital superposition of the sinus or ectatic venous branches.

Bartels, (Zeitschr. f. Aug., 14, pp. 103, 258, 458), concluded from his elaborate investigations that diseases of the *blood vessels* in glaucomatous eyes are very frequent, but mostly not beyond the scope of arteriosclerosis. They have nothing specific and nothing characteristic of glaucoma. There is no doubt that in glaucoma primary inflammatory changes of the blood vessels occur at the anterior segment of the globe and the central vessels of the optic nerve, but it is undecided whether the observed changes are not exceptions. In Bartels' cases the narrowing of the intrascleral sections of the anterior ciliary arteries and the expansion of the

posterior ciliary arteries were striking. The alterations found in glaucomatous eyes furnish no sufficient cause for rise of tension for any part of the eye. So far the ectatic perforating anterior ciliary vessels which one occasionally sees in eyes suffering from old glaucoma, have been regarded as veins. Heerfordt, (v. Graefe's Archiv, 87, 494), showed that they are ectatic veins and arteries.

Löhlein, (von Graefe's Archiv, 83, p. 547), found in none of twenty different cases of primary glaucoma, carefully examined with various chemical and biological methods, an increase in the *adrenalin content* of the blood serum and calls attention to the numerous possible errors in these examinations which had led Kleczkowski to directly opposite conclusions.

Obstruction of the *sinus of the anterior chamber*, through which the aqueous flows out from the eyeball into the canal of Schlemm, must necessarily augment the contents of the globe and raise the intraocular tension, if not otherwise regulating influences effect a compensation. First, Knies and Weber showed the frequency and importance of the adherence of the periphery of the iris to the cornea in bringing about this condition. In accordance with this, Priestley Smith, (Centralblatt f. Aug., 1913, p. 56), found adherence of the iris to the cribriform ligament or incarceration of the iris between this and the ciliary body in consequence of advancement and swelling of the lens. This occurs suddenly in acute glaucoma, gradually in chronic glaucoma. Ischreyt, (Archiv. f. Aug., 81, Bericht, 114), saw the same results from anterior adhesive iridocyclitis leading to adhesion of the root of the iris to the cornea without a special tissue between them, and Elschmig, (Klin. M. Aug., 56, 421, and Archiv. f. 81, Bericht, 114), presented anatomical examinations of six cases of adhesion of the intact anterior capsule of the lens to the posterior surface of the cornea, and organization of the exudation lying between, the anterior chamber being very shallow. Mostly it is due to ruptures of the cornea with direct agglutination, or organization of the exudation. A congenital adherence of the iris to the cornea may be caused by fetal inflammation or disturbances of development. While the older authors attributed the congenital anterior and posterior synechiae to inflammations during intrauterine life, Peters, Makroski, Vossius, Seefelder, and E. von Hippel, assumed that the common portion of the cornea and pupillary membrane remained unseparated at different places. Böhm, (Klin. M. f. Aug., 52, 83, and Ophthalmology, Jan., 1915, p. 384), found changes in glaucomatous eyes of children, aged 4 and 8 years, indicating intraocular inflammations, in that of a child,

aged 5, a typical arrest of development with subsequent ectasia of the eyeball.

The clinical diagnosis of a peripheral anterior synechia is of great importance, because iridectomy has a chance for a permanent result only if there is no firm adhesion between the root of the iris and the posterior wall of the cornea, as only then the purpose of the operation of liberating the normal efflux can be accomplished. Hesse, (*Klin. M. f. Aug.*, 52, 464, and *Ophthalmology*, Oct., 1914, p. 143), therefore developed a new method of illumination, which allows a very good view of the extent of the anterior chamber. A direct proof of a synechia in primary glaucoma and in two cases of glaucoma with deep anterior chamber and enlarged eyeball, similar to primary hydrophthalmus, was excellently demonstrated by this method. Verhoeff, (*C. Bl. f. Aug.*, April, 1913, p. 112), found in ten cases of primary and secondary glaucoma sclerosis of the ligamentum pectinatum, *i. e.*, a general thickening of the network of the ligament with new formed tissue on its surface, dependent on a preceding anterior synechia at the periphery which had been separated. The detachment was effected by the traction of the sphincter pupillae in the early cases, by cicatricial retraction of the atrophied iris tissue in the older cases. He says, however, that the etiological connection with glaucoma has still to be proved. Also Roenne, (*Klin. M. f. Aug.*, 1913, October-November, and *Centralblatt f. Aug.*, 1914, p. 211), observed in a typical case of glaucoma simplex sclerosis of the trabeculae of Fontana's spaces with deposits of pigment. Greeves, (*Lancet*, May 16, 1914, and *Ophth.*, Oct., 1914, p. 127), described the invasion of the spaces of Fontana in or after iridocyclitis by granulation tissue containing capillary vessels, the tissue ultimately forming a solid mass of scar tissue, with which the pectinate ligament became incorporated. In another group of glaucoma cases the tissues of the pectinate ligament were unaltered, but the spaces were blocked by large swollen cells, apparently of phagocytic nature.

The *iris* may show foci of infiltration, inflammatory symptoms participating in the general inflammation of the whole uveal tract, and atrophy. Ectropium of the pupillary margin may follow from retraction of the organized inflammatory products on the surface of the iris toward the periphery, by which the pigment layer is exposed. The sphincter showed in all cases moderate or advanced atrophy. Often blood vessels may be seen distinctly in the atrophic tissue of the iris. Their walls show sclerotic changes. Very recently Kœppe, (*Ophth. Society, Heidelberg*, 1916, *Arch. f. Aug.*, Bericht

81, p 112), noticed with the Nernst slit lamp of Gullstrand in forty out of fifty cases of acute or chronic inflammatory primary glaucoma a more or less marked disintegration of the pigment epithelia and their descendent lump cells. It occurs as emigration of minute dark pigment in form of dust or coarse particles from the pigment cells, and transportation into the stroma of the iris, especially near the veins, the surface of the iris, the endothelium and the marginal portions of the cornea, to the anterior and posterior capsules of the lens, the aqueous, and the ciliary body, especially the lymphatic spaces and the adventitial lymphatic sheaths of the blood vessels. These phenomena may also be observed in healthy eyes, but they arouse the suspicion of impending glaucoma. The suspected specificity of this pigment distribution for glaucoma was verified in five cases, in which the early diagnosis of glaucoma was made from these pigment changes, by the later clinical manifestation of glaucoma. Koepe surmises that these changes may be of etiological importance for glaucoma simplex by obstructing and obliterating the lymph channels, leading to gradual decompensation of lymph circulation, a lymph stasis and the picture of lymphostatic glaucoma. This may develop into hemostatic glaucoma by participation of the walls of the capillaries and veins. From a sudden rise of blood pressure an acute attack of glaucoma may result. In concordance with Hamburger, Koepe thinks that in the efferent paths of the anterior segment of the globe, besides the sinus of the anterior chamber, suction of the iris-sponge is of great importance.

The *aqueous* in glaucomatous eyes has been found especially abundant in albumen, and, as above mentioned, may contain pigment, and in consequence may be cloudy.

The *chorioid* and *ciliary body* show swelling, hyperemia, exudation, edema, interstitial inflammation, cellular infiltration, and atrophy, changes which originally led von Græfe to the opinion that glaucoma was due to serous chorioiditis. The halo glaucomatosus was found to be due to atrophy of the chorioid with loss of pigment.

The *vitreous* in acute cases is opaque from infiltration with round cells and pigment, and may show admixture of blood and liquefaction, and in the stage of degeneration may have disappeared entirely and be converted into fibrillar tissue.

In glaucoma the *anterior chamber* generally is shallow. Löhlein's studies, (39, Meeting of Ophth. Soc., Heidelberg, 1911), showed that primary glaucoma with deep anterior chamber has so far been observed only in young individuals, viz., in one-fifth of the

cases of juvenile, not hydrophthalmic, glaucoma, mostly of glaucoma simplex; in another one-fifth the anterior chamber had normal depth. The eyes with juvenile glaucoma and deep anterior chamber generally show myopia, rarely emmetropia, never hypermetropia. Haag, (Klin. Mon. f. Aug., 54, p. 133, and Ophth. Oct., 1915, p. 122), reported on 67 cases of juvenile glaucoma with 111 glaucomatous eyes. Other pathological conditions, especially general disturbances of nutrition, were very frequent. Inflammatory was twice as frequent as simple glaucoma; 31% occurred in myopia, 17% in myopia above 6.D., 28% in hypermetropia. Hence a predisposition to glaucoma in hypermetropia does not exist, but in myopia. Deep anterior chamber was more frequent in simple than in inflammatory glaucoma and occurred almost exclusively in myopic eyes.

Hereditary elements were frequently observed. From Haag's material no relations could be deduced which justify the assertion of an essential difference of juvenile glaucoma from glaucoma of adults. Löhlein, (39th meeting of the Ophth. Society, Heidelberg, 1913, p. 97), sees in the combined hereditary transmission of juvenile glaucoma with high myopia a further support of the assumption of congenital hereditary anomalies in the structure of the eye. Out of 92 cases of juvenile glaucoma he found in more than 50% formations due to arrest of development or congenital anomalies which, in a portion of the cases, proved to be directly or collaterally hereditary with the glaucoma, as persistent hyaloid artery, persistent pupillary membrane, anomalies of the retinal vessels, partial cataract, coloboma of lens, iris and optic nerve, strikingly small or large corneal diameter, signs of microphthalmus, excessive hypermetropia, etc., anomalies of development that were also, although not as frequently, observed as accompanying changes in congenital hydrophthalmus. Calhoun, (Jrl. Am. Medical Assoc., Jul. 18, 1914, Arch. f. Aug., Bericht, 1916, p. 333), assumes that every case of glaucoma simplex under 30 years of age arouses the suspicion of heredity. Small size of the cornea and eyeball play an important rôle, of general affections, perhaps gout or rheumatism. Out of 16 members of a family eight had glaucoma, two were suspect of glaucoma.

In his anatomical examinations of a large material of eyes, affected with primary and secondary glaucoma, Fleischer (38th meeting of the Ophth. Soc., Heidelberg, 1913, p. 110), regularly found in the *optic nerve* the caverns of Schnabel, if the excavation was not too far advanced. At first they were microscopically small;

in later stages the ocular end of the optic nerve was porous like a bath sponge, a regular skeleton from the loss of the nervous substance. According to Schnabel the caverns are a disease of the optic nerve specific of glaucoma, independent of increased intraocular tension, and the glaucomatous excavation is a consequence of the formation of caverns. That these changes are not specific of glaucoma has been shown by Axenfeld, Stock, and Fleischer, who also encountered them in highly myopic eyes. Fleischer found the cross-section of the nerve in the area of the caverns enlarged, the pial sheath thinned and bulged into the intervaginal space. This can only be explained by the caverns being filled with fluid under considerable pressure. He therefore attributes the cause of the formation of caverns to imbibition of the optic nerve by a fluid in consequence of lymph stasis, which again is due to disturbances of circulation in this part of the nerve. The anatomical changes which led him to this view were the edema of the disc in the incipient stages of glaucoma, the greater affection of the axial portions of the nerve around the central vessels with loosening of the central fascicle of connective tissue, dilatation of the perivascular sheaths and the engorgement of the small vessels of the optic nerve. Clinically corresponded to this slight swelling and haziness of the disc in incipient glaucoma, thickening of the veins, perhaps also halo glaucomatosus, and the peculiarity of the glaucomatous visual field, showing an isolated involvement of certain parts of the nerve or single bundles, which can only be ascribed to the disease of single vascular territories. That a permanent lymph stasis may be followed by degeneration of the nervous elements, an excavation of the affected nerve bundles, and swelling of the nerve, is easily conceivable and is not without examples in the pathology of the central nervous system, *e. g.*, certain forms of syringomyelia. The occurrence of these changes not only in primary, but also in secondary, glaucoma proves that the formation of caverns cannot be a primary affection of the optic nerve independent of intraocular tension, as Schnabel maintained, but must be a secondary process in consequence of increased intraocular pressure. In lacunar formation in high myopia the cause of the disturbances of circulation must be sought, not in the pathological intraocular tension, but in general diseases of the circulatory apparatus, increased blood pressure, vascular sclerosis, etc. By this the possibility is given to explain the origin of the glaucomatous excavation in glaucoma simplex without rise of intraocular pressure. According to later anatomical investigations of Ischikawa, (*v. Graefe's Arch.* 87, p

429), the first pathological changes of the nervous tissue in glaucoma commence in the nerve fibers of the intraocular and vascular portions of the optic nerve. They consist in swelling and dissolution of the nerve fibers. The swollen fibers may give the aspect of incipient caverns of Schnabel. The same changes occur regularly in the nerve fibers of the retina. The fluid which, after the disintegration of the nerve fibers fills the lacunæ, prevents the contraction or vicariating proliferation of the remaining glia and connective tissue. Later on also these tissues disappear and the caverns result. The causes of this degeneration of the nerve fibers probably is, in connection with the increased tension, a qualitative alteration of the ocular fluids, which leads to the autolysis of the nerve fibers, the glia, and connective tissue. The glaucomatous excavation is exclusively the consequence of the glaucomatous nervous degeneration, characterized by the formation of lacunæ in the nerve bundles. Gilbert, (39 Ophth. Soc., Heidelberg, p. 342), also emphasizes the importance of disturbances of circulation for the genesis of the caverns. In a series of cases of primary glaucoma he found such near topic relations between recent hemorrhages and the formation of small caverns, that he does not doubt that the caverns may also be caused by hemorrhages.

The depth of the excavation varies from 0.6 to 1.50 mm. and occasionally more. I brought you here a microscopic slide, which you also can see well macroscopically, of an excavation measuring 2mm. in depth. It is from the eye of a woman, whom I first saw in 1911, suffering intense pain from absolute glaucoma in both eyes, which were blind. This was relieved by treatment and the patient regained a little sight in the left eye. In October, 1914, she came again with ulceration and abscess of the right cornea, which necessitated enucleation.

Behr, (Klin. Mon. f. Aug., 5², June, 1914, p. 790, and Ophth., April, 1915, 579), reported the anatomical examinations of two cases, in which the excavation, caused by the displacement of the lamina cribrosa backward, was filled in by tissue. From these cases and a review of literature B. distinguishes three characteristic types: The first shows the properties of gliosis. It consists in a more or less energetic proliferation of the glia tissue (cells and fibers), and new formation of numerous vessels with thickened walls. The proliferation may be so excessive, that not only the excavation is completely filled by it and that it spreads into the layer of nerve fibers of the retina, but that the tissue bulges like a mushroom into the vitreous and resembles choked disc. Besides

these active proliferations also hyaline degeneration and formation of cysts may be found. Occasionally gliosis may be combined with inflammatory changes, which perhaps are identical with the still unknown primary cause of inflammatory glaucoma. Nothing definite is known of the etiology of this gliosis.

The second group comprises cases, in which the greater portion of the nerve fibers has escaped atrophy. The papillary tissue on the lamina cribrosa is loosened by small-celled infiltration and inflammatory edema, filling the excavation completely. B. thinks it probable that the affection also in these cases is due to proliferation of glia, before the inflammatory alterations set in. Possibly these cases represent an incipient stage of the first group, from which they differ by the presence of numerous nerve fibers and inflammatory elements.

While in these two groups the disappearance of the glaucomatous excavation by proliferation of tissue takes place under persisting increased tension, in the third group an operative restitution of normal intraocular tension revives and loosens the compressed tissue of the disc, sometimes under edematous phenomena, and the retrocession of the lamina cribrosa decreases more or less. In these cases the complete restoration of the normal level of the disc is exceptional. Its persistence depends upon the endurance of the diminution of tension.

As you will have noticed, I did not aim in this brief survey at a complete enumeration of everything that has been published on the pathology of glaucoma, and which you may find in the textbooks, but confined myself to the utilization of the important points of the literature of the last five years.

STATE LEGISLATION CONCERNING THE BLIND.

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CHICAGO, ILLINOIS.

The question as to who may properly be called blind is not yet settled. Various views are held as to how blind a person must be to be designated as "blind" to receive public assistance. For the purpose of this communication those people will be considered blind, whose vision is completely lost, or is so slight as to be of no material assistance to them in earning a livelihood. The subject of "State Legislation Concerning the Blind," brings into view the old but ever-present question as to the economical preference between "prevention and cure." In this particular instance it invites an answer as to whether it is cheaper to prevent blindness, or to care for people after they become blind? I trust I may be pardoned for putting the question thus plainly and brutally, for after all the financial side of things appeals to more people than the humanitarian side. I am not unaware of the fact that this statement may frequently be reversed, and that "doing good unto others" is the watch-word of thousands of men and women, and that practicably all charitable movements, are based upon the tenets of the "Golden Rule." But "practical" people, and especially "practical politicians" look at most public matters from a practical, or in other words, from a financial point of view, and our legislators must be able to show their constituents that, while they have spent money for certain apparently benevolent purposes, it was after all, the cheapest and best thing to do under the circumstances. By thus concealing, what might otherwise be regarded as an act of pure generosity and humanity, and loudly extolling its financial soundness, the legislators may be able to continue in office, and to be regarded as the wise distributors of the riches of the commonwealth notwithstanding the fact that large sums of money are contributed by the various states for the support of the blind. The condition of the blind would be hard indeed, if their welfare was not so well guarded by charitable benefactions from private sources, lodges, etc. The blind *should* be cared for by the state, because the state is largely to blame for blindness, but the state seems quite willing that the public should largely bear its financial burdens. Of course, only state legislation concerning the blind, will be particularly referred to in this communication. I am sure that no thoughtful and observing individual will contest the statement that prevention is cheaper than cure—or to bring it down flatly to the subject of this

series of papers, it is cheaper to preserve good eyes, than to be burdened with poor or blind eyes. This is true with individuals, and it is also true with communities. Take the subject of Ophthalmia Neonatorum, for instance, which disease is principally instrumental in peopling our blind asylums. How much cheaper it would be to pass an adequate law for the control of this disease, and to see that the law was observed in any given state, than it is to support people in blind asylums, and then to help them support themselves, or to pension them, for the remainder of a long and weary life. The proper education and licensing of midwives, the prompt registration of births, the free distribution of a prophylactic (1 per cent. nitrate of silver solution preferred), the compulsory use of the prophylactic, the prompt reporting of red eyes in babies, the immediate employment of an eye surgeon, the proper care of the child (preferably in a hospital), etc., would all cost but little in an entire state, especially as the use of a proper prophylactic at each birth, would prevent almost all cases of Ophthalmia Neonatorum. Contrast this with the case of maintaining a blind child in an asylum, and then pensioning this person, or partly supporting him, all through the remainder of his life. Surely no one will pretend to say that prevention is not cheaper than cure, under these circumstances, for it must not be forgotten that unless these unfortunate people are financially independent (and they very seldom are), they have to be helped all through life, either by a definite pension, or maintenance in a poor house, or helped to learn a trade or profession and then helped to dispose of their goods, or services afterwards, etc.

The establishment of industrial homes, and workshops for the blind, and the opening of stores where their produce may be marketed, is one of the greatest up-lifts for the blind, that has ever been devised. These goods must be made as well as if made by seeing workmen, and the blind must realize that their produce must sell on its merits, and not through sympathy. The scheme produces an income, self-respect and happiness. If Ophthalmia Neonatorum could be practically eliminated from this country, by wise legislation rigidly enforced, millions of dollars would be saved, that could be devoted to really necessary causes, and the stock of human happiness and usefulness, would be immeasurably increased. The same argument can be advanced concerning the annual and systematic examination of school children's eyes and ears, the treatment and elimination of trachoma, the regulation of shop conditions, such as illumination, the use of goggles, the

control of machinery and the elimination of the "Shop Oculist," the education and licensing of midwives and the control of midwifery, the control of optometry, etc. If all these reforms could be brought about, and this great mass of ocular diseases, defects, etc., reduced to a minimum, and the expense of maintaining asylums, hospitals, doctors, workshops, pensions, etc., contracted to the smaller amount commensurate with such new conditions, millions of dollars could be saved annually, and life and self-respect infinitely enlarged to thousands of people. Neither must it be forgotten that education is the greatest foe to crime, and that anything lessening the possibility of the acquirement of an education, contributes to the volume of crime. Therefore children whose eyes, ears, etc., render the absorption of teaching difficult, usually dislike and shirk school work, are apt to become truants, to seek bad associations, become familiar with small and great crimes, and may easily and ultimately become confirmed criminals, jail-birds, etc., and entail much expense upon the community through the maintenance of added police service, courts, reformatories, jails, etc. In other words, if the systematic and annual examination of school children's eyes and ears, was universal and thorough, and properly followed up, thousands of children would enjoy their school, would easily acquire an education, would become useful citizens, and millions of dollars would be deflected from the pursuit and punishment of criminals, into happier and better channels. I think no one will deny these statements, they are so plain as to be self evident; and no one will deny that it is the duty of the people, the law-makers and the authorities, to see that proper laws are passed concerning these matters, and then to see that the laws are rigidly enforced. It is their moral, sociological and financial duty to the country. Then why is it so difficult to secure action, in creating such reformatations? The answer is complex. Probably the greatest reason is public inertia. Legislators and civic authorities, will usually do what the public really demands. Some of them actually desire to follow manifest public conceptions, others, dare not do otherwise. They wait for the clearly expressed voice of the people. But the people have other things to think about. It is not that they would not decide such matters properly, if forced to meet them at close range, face to face. But this does not often happen, and so they just let such matters drift, feeling that somehow, sometime, somebody will perform this vicarious service. It is the same reason, that keeps many good people away from the polls, when they should get out and

vote. They have conceptions and opinions perhaps, about candidates and principles, but they are busy, or not feeling well, or the day is unpleasant, and they think that one vote more or less will not make any difference, and so they do not vote, but this does not prevent them from indulging in loud denunciations after the election is over.

Another difficulty encountered in making reforms can be found in the legislators themselves. Far be it from me to impugn the purity of motives residing in the breast of the average legislator. I simply state that it seems difficult to secure moral or uplifting legislation in most of our states. This may be because the public does not manifest a sincere and continuous desire for certain uplifting legislation, by exerting an influence at the capitol city, or by securing newspaper cooperation. Of course, unless the subject of the desired legislation is fully explained and enlarged upon to the average legislator, and unless he can be made to see that prevention is better and cheaper than cure, he cannot be entirely blamed for feeling that he would perhaps be spending the public's money for somebody's "fads or fancies," and that he will not do so, at least to the extent desired by most enthusiasts. Legislators seem to think they are performing a very noble and magnanimous act when they make appropriations for blind asylums, workshops for the blind, readers for the blind, pensions for the blind, libraries for the blind, etc. I do not wish to belittle these state benefactions, but I unhesitatingly declare, that the friends of the blind, are only asking for what they have a right to expect, and they never get what they desire. Conservatively estimated 50,000 of the 100,000 blind people in this country are blind unnecessarily. They are blind because the state has failed to protect them at birth, in schools, in shops, in trachomatous regions, etc. I accuse the state of these crimes. If the state had done its duty, and taken care of its unprotected wards or citizens, there would have been comparatively little blindness, and most of these provisions for the blind would have been unnecessary. Therefore, inasmuch as the state is at fault, in not doing what it can to prevent blindness, let the state provide for the blind, and let not the state feel overly inflated over its meager and belated provisions. It is cheaper and better and more humane and just, for the state to pass laws *preventing* blindness, and then to see that these laws are carried out, than it is to pay for the support of the blind, after the crime has been committed. This statement is emphasized, when it is remembered that it costs ten times as much money to educate a

blind child, as it does to educate a seeing child. For instance, an average school book for a seeing child costs about \$1.50, while for a blind child practically the same book costs about \$22.00. It may be here stated that it costs from \$15,000,000 to \$20,000,000 per annum to support the dependent blind people of this country. Still another obstacle toward reformation along these lines is the crime on the part of the authorities, in disregarding preventive laws, and in not punishing the offenders. For instance, there exists in a certain state, a Society for the Prevention of Blindness. Amid much rejoicing a law was passed by the legislature, for the control of Ophthalmia Neonatorum. Shortly after a child was blinded because the doctor did not observe the law. The case was turned over to the society to prosecute. It was a clear case, and the evidence was complete. Some prominent members of the society, however, strongly advised against the prosecution of this acknowledged offender because—forsooth, it might arouse the antagonism of the medical profession. It was only with much urging that they were finally induced to have the courage of their convictions, and prosecute. The doctor was fined, and this first case in this state, has done much good in the community; more good in fact, than many lectures and reams of literature. This is but an illustration of how difficult it is to see that laws are enforced, even after good laws have been passed. There are enough good laws on the statute books of this country, to control almost all evils, if they were only observed, but such laws are often forgotten or unobserved, or thought to be unwise or impolitic to enforce, and they fall into disuse, and might just as well never have been passed.

These are some of the reasons (perhaps the most important ones), why it is difficult to secure action in creating reforms, and it is safe to say, that until these conditions are markedly improved, the way of the reformer will be hard indeed. Of course, little by little better conditions prevail, and better government is secured, but it does seem strange, that laws for good vision (when blindness can be so easily minimized), and which can be so thoroughly proven to be distinctly economical, and which can be unquestionably demonstrated to immeasurably increase the happiness and well-being of the human race, it does seem strange I say why such laws are not promptly and easily enacted and afterward enforced.

I have taken the liberty at this point to quote in its entirety the excellent pamphlet by F. Park Lewis on "What To Do For Blind

Children," appearing as Pamphlet No. XIX in the "Conservation of Vision Series," of the American Medical Association. I make no apologies for doing so, as this pamphlet is perhaps the best short exposition of this subject in English print. Mr. Lewis says, as follows:

When the great sorrow of having a blind child comes into the home, it rarely happens that those who are nearest and dearest to the little afflicted one have had any experience with blindness or with the blind, or have any knowledge as to what to do for the development of the child, or when, where or how his education should be begun. The family is in many cases so overcome with a feeling of sympathy that their tenderness is shown in excessive and prodigal care. The child is assumed to be helpless and every slightest want is anticipated. Through the period of babyhood and young childhood, and even much later, those personal things that even a blind child might do for himself are done for him, and he is apt to grow up, not only helpless and weak, from the lack of the use of his functions, but selfish, arrogant and dominant, as any child will who fails to learn the lesson of submission to authority and to acquire the power of self control. This neglect of early training is of lasting injury, and the resulting damage is in every case difficult to repair.

Some times, on the other hand, in the more sordid homes where poverty and ignorance are associated with vice, or in which blindness in the child is combined with physical and mental defects, the poor little creature becomes the victim of unimagined neglect. Such children have been found hidden away in back rooms and in dark closets, concealed from the knowledge of the public and treated like animals.

It becomes, therefore, a matter of importance that all cases of blindness shall be known. There should be some public body, such as a State Commission for the Blind, a form of organization which has already been established in Massachusetts, Ohio and New York, having authority to seek out and to find all such afflicted children, so that they may be placed under proper control when necessary, and that the parents and friends in other cases may be advised as to the care which should be given to such children and where it may best be found.

It is never possible to consider blindness as anything other than a great calamity, and it is peculiarly dreadful when it occurs in a young child, but it is by no means an imperative bar to a happy and successful life. It is a matter of common observance that blind people are as a rule happier than are those who are deaf. The reason for this is, doubtless, that the blind, because of their apparent helplessness, immediately excite a feeling of sympathy and a desire on the part of those about them to be of assistance to them. They are, therefore, more gently cared for and more kindly treated and they receive greater consideration than is accorded to the deaf, whose affliction, not being so evident, is not recognized, while their failure to promptly respond is assumed to be due to carelessness or inattention. It makes those having to do with them impatient in consequence.

EARLY TRAINING NECESSARY.

If the blind receive suitable training at a sufficiently early age to develop in them that strength of body, of intellect and of character that is the prerequisite of any successful life, their possibilities, strange as it may seem, are not greatly lessened by their loss of sight. This has been demonstrated in the lives of a multitude of successful blind men and women. England's ablest postmaster general, Mr. Faucett, was blind. He rode horseback, skated and did many things that are supposed to require eyesight. The most wonderful and exact observations on the life history of the bee were made by a blind man who directed the eyes of his servant. Musicians have written and played, and Mount Blanc has been scaled by blind men. It is the mind and the spirit which control, and when these are great they dominate and rise superior to mere physical deficiencies. The inspiration of great ideals must be held out to the blind, even more than to the seeing from the very beginning.

It is not enough that the blind man or woman shall have physical strength but his training must be so well balanced as to give him poise as well as vigor. It does not suffice that the blind man shall be as well educated as is his fellow who sees. Handicapped by the loss of the most important of his special senses, he must supplement this deficiency by a better training of his mind and his body. It is not enough that he should have the good character of the average man. His word and his reputation must be beyond question. He must be independent and proudly unwilling, except when absolutely necessary, to accept that for which he cannot in some way return an equivalent. He must be taught to reason with clearness and with logical precision, for he must succeed by the aid of his mentality and his character, rather than by his manual exertions. If his are very ordinary gifts, as often happens, and he is obliged to depend on his manual exertions then, even more, are honesty, integrity, cheerfulness and an obliging disposition essentials which he cannot get along without, because friendlessness, due to a surly disposition, or to unworthiness, added to blindness, make a combination that is almost hopeless. These facts are emphasized here because if such qualities are to be secured, the training which produces them should begin in the cradle.

If a baby is born blind (and the largest proportion of blind children are those who come into the world with defective eyes) or if he has the misfortune to lose his eyes shortly after birth through one of those preventable infections which should never happen, but which today is the next largest cause of infant blindness, his training should begin at once. The baby can learn system in his home. He should be bathed and fed and put in his cot in order that he may go to sleep, with absolute regularity unless something extraordinary happens to vary his habits. He should be taught, and he will learn, that he cannot get what he wants by crying for it. A young child will quickly learn that, unless he is suffering from physical discomfort, he must submit to regular control. In these early months, the laws of health should be rigidly observed. His food, if possible, should be that which nature has provided for him, his mother's milk. He should spend as many hours in the open air and bright sunshine as possible, although even

his blinded eyes should be shielded from the glare. He may be spoken to during his waking hours rather more than one would speak to a child with sight, because chiefly through his ears is he brought in contact with the world.

In the first few years is laid the foundation of his whole life. It is the plastic period in which he is most easily moulded by outside influences. It would be well at this period that his parents should learn about the schools for the blind, and secure advice concerning the training of the child during the intervening years before he may be admitted into the kindergarten.

As he begins to creep he should be allowed to do things for himself. He must familiarize himself with the objects around him. It would be easy to so modify the Montessori appliances that under intelligent direction, but without outside help, the child may learn to recognize the difference between hard and soft, rough and smooth, hot and cold, long and short, and also between good and bad and right and wrong. His physical and moral education should come as naturally and as easily as the food which he takes or the air which he breathes.

MONTESSORI AND THE BLIND.

The method of training children by developing their special senses as devised by Prof. Marie Montessori is peculiarly suitable for blind children. The apparatus is exceedingly simple and could be made by any carpenter. Among the forms employed are those designed to develop the sense of touch. On flat blocks are attached substances of varying degrees of smoothness and roughness, from coarse sandpaper to a polished surface. Distinctions of different qualities are determined by means of the finger and degrees of coarseness and fineness are recognized as are the softness of velvets and the hardness of steel. This can be varied according to the inclination of the teacher, by his introducing coldness, warmth, etc. Outlines of form are given the child as playthings and he is taught by his sense of touch to distinguish between the square, the circle and the triangle as well as between the regular and irregular outlines of form. Insets are provided by which blocks of different shapes are fitted into the places to which they belong. This will gradually lead to the more intricate forms of raised maps, raised picture puzzles, etc. The child is taught to distinguish by holding them in his hand the difference in weight so that he may recognize which is the heavier and which the lighter. He learns by special appliances how to lace materials together and very soon he can apply this practical knowledge to the lacing of his own shoes. Strips of cloth with buttons sewed along the edge are given to him and other strips with button holes, and he soon is taught not only the manipulation of slipping the button into the hole but the faculty of fixing his attention is developed in determining where the strip begins so that it is buttoned properly. In this way he is not only acquiring technical skill but he is learning to use his judgment and observation which will prove to be of great value in every other act of his life. The training that comes from the estimation of size, of form and of quality, and the judgment that comes from the application of like forms to each

other initiates a series of mental activities that may be elaborated and carried on indefinitely.

As he learns to walk, make sure that he has an unimpeded way before him. In the second or third year little experiments may be undertaken. The room in which he plays should be as free as possible from unnecessary furniture. Possibly part of a room might be temporarily walled off and given to him absolutely. Here he may have his blocks with which to build, or his moulding sand, thereby teaching him control of his fingers and coordination of his muscles. He must have freedom to run and to play, and to exercise without the fear of harm coming to him. Gradually as he learns to guide himself he may have introduced into his playroom obstacles to overcome. An inverted box may be put on the floor. He will learn from handling it what its shape and limitations are. He will be able to avoid it in his play, or to scramble on it and down from it, thereby increasing the strength and control of his muscles and adding to his self-confidence. Then, as his training progresses, he may be taken out of his limited area into the general living room, which again should have as few unnecessary articles of furniture in it as possible. His training will have progressed so far that he will be able to climb on the chairs or sofa, or to push a stool before him. In the beginning confusion must be avoided by not having more than one object in his way at a time. Concentration of mental or physical effort will come slowly. Gradually but surely his sphere of activities will increase. In the safe space allotted to him he will learn to run fearlessly and to jump, under the watchful eye of his guide, who will not show him how to do things but will prevent him from harming himself. He will learn the danger of going too close to the glowing fire, and will locate the stairway down which he will creep.

He is approaching the most important period of his whole education. He will now learn if rightly taught, obedience and self-control. Each day will open before him a new world of wonders. He will be initiated in the mysteries of buttoning and of unbuttoning his clothes. He will be taught how to sit and how to stand, and efforts will be made to prevent him from acquiring any of those mannerisms of the body or of the features that so seriously militate against the success of the blind. Some of the most common of these are rocking the body, twisting the head about, sticking the fingers into the eyes, distorting the face, swinging the arms, stooping and hanging the head in walking and bending over in sitting. As soon as such practices are observed, a vigorous attempt should be made to break them up, for, if they once become habitual years of schooling may be unable to overcome them.

If the eyeballs are unsightly and repulsive, as the result of disease, it would be well at this period to consult a dependable oculist with a view of having the deformity corrected. It is a less formidable operation now than it will be later, when he is old enough to dread it. If he has difficulty of breathing through his nose, especially during his sleep, he should be examined for adenoids. These, together with large tonsils, if present, should be removed. Blindness is a sufficient handicap without having possible deafness added.

THE BLIND CHILD AND THE OUTSIDE WORLD.

At this period he will acquire with great rapidity his knowledge of the outside world. If a normal child in other respects, he must not be kept in seclusion. If mentally deficient as well as blind, he should be placed under proper custodial care. As far as possible he should, in his play and in his work, be brought into contact with other children who have all of the normal functions. He can be taught to be independent and courageous, and at the same time cautious. He will soon acquire that marvelous quality, which has been misnamed, the sixth sense, or touch at a distance. He will feel the trees as he nears them. He will be conscious of the open and closed spaces when he comes to them. His ears will grow keen in the recognition of approaching sounds, and he will determine from the reverberation whether the pathway is free or obstructed. When the kindergarten is open to him, the songs that he will sing as the children march with him will teach him rhythm and expression. He will gradually make his fingers the servants of his will, thereby developing the brain centers which control them.

At this early age he will have begun to exercise his reasoning powers and unconsciously will draw conclusions as to the effects that follow causes. He will have learned that fire burns children as well as coals, and that he must approach the blazing grate with caution, that fragile things are easily broken and must be handled with care, that the water pitcher if pulled over will give him an uncomfortable wetting. It will be evident to him, although he will not understand the philosophy involved, that the rules of right living may not be transgressed without the expectation that punishment will follow. He will then have taken his first degree in the school of life.

Soon he will acquire knowledge of a more technical character. He will begin to learn to write by means of the point print which is used in the schools for the blind, to one of which he will be sent by this time. The letters used in ordinary print, if they were pressed through the paper so as to be raised above its surface, would be so small, and the parts would be so close together that they could not be distinguished by the touch of the most sensitive fingers. It was learned many years ago by a young Frenchman, himself blind and a teacher of the blind, that when fairly thick paper is raised into a little mound by a pointed stylus being pressed against it, into a slight depression on the other side of the paper, that the raised point which is so formed on the paper is readily felt by the sensitive finger tip. By arranging these points in varying positions in the space of a cell made for six such points, combinations can be made to represent all of the letters of the alphabet, as well as the signs used in arithmetic, algebra and music. This, the Braille point print, as it is called, is the basis of the point print system, which is used throughout the world by the blind. It has been somewhat modified in America. In some of the schools for the blind the cell is placed horizontally instead of vertically, but the differences are not material and fundamentally the method is the same. It is hoped that in the near future a single system may be made of general application.

TANGIBLE PRINT.

By means of the point print in some of its modifications, blind children in their schools follow practically the same course of instruction as that found in the curriculum of schools for normal children. The standard text-books in arithmetic, grammar, geography and geometry are used also in the schools for the blind. The courses include history, Latin and Greek, as well as modern German and French. The methods are perhaps somewhat more practical in the schools for the blind, in that greater discretion is exercised as to the natural qualities of the individual student. Those having mechanical skill and aptitude are more thoroughly instructed along mechanical lines, where, more especially, manual training is of value. Both boys and girls are taught the use of the saw, the plane and the square. Incidentally, they learn accuracy in their work. They are taught from practical experience that there can be no such thing as a "tolerably" square box or a "fairly" round circle. It is a continuance of the training already begun, that exactitude and precision are the basic elements in education as in life.

If piano tuning is to be the special field chosen for their life work, then they should be tuners of the first rank. They must do their work so well that they will be sought for by the most exacting, otherwise their blindness will be a handicap difficult to overcome. Those of average ability do, however, succeed in this work.

If they are so fortunate as to have musical gifts, not alone the technic of music should be absolutely acquired, but its essential principles must be fully understood; they must know harmony and composition, the history and development of music and the structure of the different musical forms.

If they are to be business men, they must acquaint themselves fully with the methods of modern business. They cannot depend on a pencil and paper to make notes as do those who see, therefore they must learn to think quickly and accurately. The memory must be cultivated.

CONCRETE METHODS.

In the New York State School for the Blind the children learn the multiplication table through the twenties, so that if a boy of twelve is asked how much is seventeen times nineteen the correct answer comes instantly. Special appliances and methods are necessary for instruction. Scales, weights and measures are used to enable them to determine the bulk of a pound of sugar, or of a quart of milk, or of a peck of potatoes, or the length of a yard of cloth. They are taught the quality of materials, so that they can determine by the sense of touch whether the fabric is of cotton or of wool or a mixture of both. They are taught values, and incidentally they are taught ethics and morals, and, as often happens, the incidentals are most important. Thus they are fitted to take their places in the business world or in the home. The girls are taught to sew and to weave, to make hats and to knit stockings. They are taught the principles of home-making, how to cook and what constitutes wholesome and sanitary living. More essential than anything else, they are taught the principles of order. They must very quickly learn that unless their lives are gov-

erned by perfect system, confusion is the inevitable consequence. A place for everything and everything in its place becomes the dominant rule of their lives. As they cannot by a glance around the room find where misplaced things are, it becomes imperative that every object shall be kept where it belongs and it must be put back there after it has been used. All learn to use the typewriter; for this wonderful instrument eyes are not necessary and it makes a method of communication between the blind and their friends, simple, accurate and practicable. For the teaching, particularly of special topics, special appliances must be used. For geography, raised maps are employed and a more vivid picture must be presented to the minds of the blind as they feel the mountain ranges and the depressions for the valleys and the rivers, the points which indicate the cities and the divisions which mark off the states, than is conveyed to those who see by the printed word and the differentiating colors. Special movable blocks are used for teaching arithmetic and adjustable lines and circles for teaching geometry. Raised pictures have been employed for the study of modern history. The mounted bird and the geological specimen convey almost as much to the educated fingers as can be discovered by the glance of the eyes. The blind are taught to distinguish the voices of the birds and to hear the multitude of sounds that escape those of us who see, so completely does the sense of sight overwhelm the other senses. The work in a school for the blind is conducted under the same system, with the same regularity, with the same cheerfulness and brightness that is found in any well-conducted school anywhere. So admirable is the discipline that the school, by means of the fire drill, can be emptied in two minutes when the alarm bell is rung.

One of the greatest difficulties with the blind is to teach them proper table manners. Unless care is exercised, the blind child is apt to fumble at meals with his hands and upset his drinking glass or salt cellar. Under proper training, however, he very soon learns where each object is placed before him and what special things are on his plate. It is best that there should not be too many articles of food given to him at the same time. He can then by delicately manipulating the fork find where is the meat and where the potatoes. He will very delicately locate the cup containing his tea, or the glass containing the water. The meat having been cut for him, he can by means of a piece of bread in one hand and the fork in the other, feed himself as delicately as do those who see.

The habit of excessive cleanliness and care of the person must be emphasized early in life. Not being able to see that his hands are soiled, he must be taught to wash them frequently. The finger nails should be frequently attended to, his hair should be kept nicely brushed and his clothes must be kept free from the dust falling from his hair, or from other evidences of uncleanness. The personal carriage of the blind is of even greater importance than to those who see. An erect position is infinitely more attractive than the stooping or groping motion that is so often assumed by the untrained blind. Much can be done in the matter of personal bearing by the training received in the gymnasium, in walking or in dancing.

TRAINING THE VOICE OF THE BLIND.

The training of the voice is of vital importance. A pleasant, well-modulated voice with a cheerful expression has a winning effect. As the blind are unable to see the faces of those to whom they speak, there is apt to develop an appearance of unresponsiveness and instead of reflecting back a pleasant expression which one meets on the face of a friend on encountering him, the blind person, not seeing, is apt to show nothing in his facial expression. He could very early learn to reflect his own pleasant feelings and to assume that he is greeted, when he speaks to a friend, with a pleasant smile, and return this frankly instead of the half smile or the twitching of the corners of the mouth, which so often mars the facial expression of the blind. The features must be controlled as each of the muscles are controlled. When one feels pleased, he must look pleased, he must learn to smile and to speak agreeably, as a matter of training, so vital are the results to all of us.

Be careful what is said before the blind child. Not seeing, he listens with all his ears. Never speak pityingly of him. Such expressions are discouraging and depressing. Speak rather cheerfully. Teach him to believe in himself by believing in him yourself and by having confidence in his ability. Reward his successes and speak encouragingly of his failures. He needs this stimulus even more than do those who see.

The possibilities of the blind and the varieties of work which they can do are much wider than ordinarily realized. There are blind persons who are successful in business, in the law, in medicine, they have become successful teachers, musicians and writers. Many simple mechanical lines of work are satisfactorily taken up without the aid of sight. It is readily evident, however, that those occupations which are mental rather than physical are those in which they succeed in the highest degree, and when it is possible these should be the lines chosen for those who must make their way in the world without sight.

One of the most important elements in the instruction of the blind is that they should early be trained to distinguish coins from the sense of touch. This is not difficult but it requires a little special application. The size of a penny, a dime and a quarter are sufficiently unlike to make it possible for blind persons of keen intelligence to immediately distinguish them. When the sense of touch is sufficiently trained it is possible to differentiate between American and Canadian coins even when of the same denomination. A blind lad in one of the state schools has his ear so acutely trained that when coins are jingled together in the pocket he is able to tell with almost absolute accuracy the number of coins and their value, and whether they are silver, copper or nickel. As each has a tone peculiarly its own, it is only necessary that the ear should be keen and close attention given in order that this may be done.

PERSONAL HYGIENE.

As the growing boy begins to approach manhood he will have been taught the essentials of personal hygiene, when and how to bathe himself, how to polish his own shoes, and as his beard begins to grow

he must be taught how to shave himself. This will not only add to his mechanical skill but will be another lesson in the series of principles which are being inculcated, to always do for himself everything that is possible for him to do. He will learn the mechanism of the safety razor, and if his fingers have been delicately trained on the piano or the typewriter, he will be able to tell from the sense of touch whether he is shaving himself properly, and to do so without doing himself an injury. He will be learning how to distinguish the qualities of razors and how to use his razor strop; indeed, all of these special lessons that are necessary in order that he may properly care for his own toilet, he will acquire during these early years of his life.

Special teachers for blind children are exceedingly difficult to obtain, and they are rarely necessary. It is not usually desirable that the child should be placed under the care of a governess or a tutor, so essential to the development of the child is the contact with other children. In some of the larger cities, such as Chicago and New York, provision is made in the public schools for blind children and those having such defective sight that are unable to follow the usual school curriculum. In almost every state there is now a school for the blind, and where special provision is not made in the public schools or even sometimes when there are special classes, it is better that the child be sent to a school for the blind at the kindergarten age. In several of the states, commissions for the blind have been established and in others workshops and homes. The schools are maintained on very much the same lines as the ordinary public schools. Tuition and maintenance are free. The purpose of the schools for the blind is to furnish an education and training in some useful trade to all children who, on account of defective vision are unable to secure an education in public schools. In most of the states, the laws governing the admission of pupils to the schools for the blind are practically the same as those of the state of New York, in which children not under 5 years or over 21, whose parents reside in the state, and who are not incapacitated by physical, mental or moral infirmities are eligible. This includes many who have some sight, but whose vision is so defective that they cannot be educated in the common school. In exceptional cases, those over school age, for whom industrial work might be an advantage are admitted by special action of the board of managers when it is thought desirable and when there is room in the school.

In a certain percentage of cases of blindness in children, the loss of sight is but one of the manifestations of a general defective development. It may be associated with any of the grades of feeble-mindedness, even to idiocy. In such cases no attempt should be made to adjust the child to the conditions of ordinary school life, but it should be definitely classified with those of its own mental grade and cared for in accordance with the methods adopted for the feeble-minded.

The earlier a child goes to school the better are his chances of becoming a useful self-supporting and happy citizen. The mistake is often made in keeping him at home through mistaken sympathy, when he should be under definite and systematic training. The teachers and instructors in the schools are large-hearted, sympathetic men and women, and the schools are made as home-like as possible. A physician is

in frequent attendance at the school and is always available when needed. Hospital facilities with good nursing are provided in cases of necessity, and the parents are always welcome at the school and are invited to interest themselves in the work that is accomplished there.

Books for the blind are published in a number of forms of point print, by the Publishing House for the Blind at Louisville, Ky., and many of the public libraries have now established a lending department, through which books in tangible print for the blind may be obtained. Through special provision made by the federal government, these special books, which are large and bulky, are transmitted through the mails free of expense. A tag is attached to the book, and to return it, it is only necessary to place it in the nearest mail box.

THE MOON TYPE.

A form of type that is very commonly used among older blind people, but is infrequently used with children, is what it termed the Moon type, so called after Dr. William Moon, by whom it was devised and through whom, with the aid of his son, the late Dr. Robert Moon, it has been extensively circulated throughout the world. It consists of letters formed very much like the large Roman letter and raised by being stamped through the paper so that they may be felt by the fingers. Books printed in this type are so bulky that its usefulness is confined to those whose fingers are unable to appreciate the finer points of the Braille or some of its modifications, which is now used in all of the schools.

In printing books, zinc stereotyping plates are used, so that a large number of sets may be produced from a single plate. Through this method not only are all of the ordinary school books prepared for blind children, but as well almost all of the classic literature and much that is modern in history, science and fiction.

One of the most important philanthropies inaugurated in the interest of the blind has been the establishment of the Ziegler Magazine, which is printed in the raised point, and which is sent to all blind readers who care to have it, practically free. It is modeled after the current magazines, being especially devoted to those interests relating to the blind and their progress. It is published at 205 West Fifty-Fourth Street, New York City, under the editorship of Mr. Walter C. Holmes, who is always pleased to have the addresses of those who would be interested in receiving the magazine. The most useful American publication for the blind in black print is *The Outlook for the Blind*, under the editorship of Mr. Charles F. F. Campbell of Columbus, Ohio. It is published at 962 Franklin Avenue, Columbus. It summarizes all of the work done for the blind in this country as well as throughout the civilized world. It brings the friends of the blind in touch with each other, discusses problems for their education and advancement, methods of developing industries, and measures by which blind workers may be introduced to those willing to employ blind labor. One of its special features has been the education of the seeing, as to the needs and the possibilities of the blind. Of almost as great importance is it that the seeing should learn to believe in and have confidence in the blind as it is that the blind should believe in themselves.

When this mutual confidence shall have been established the possibilities of future development for this class of our citizens will have been greatly enlarged.

For those who have had a little sight and who have been taught to use the hand in writing, a special slate is employed. This consists of a metal body across which are a number of raised ridges, which keep the pencil within certain limits. This enables the writer to make a clear square letter which is easily read, and which the blind, after proper training of the hand, readily learn to make. All materials used in teaching the blind can be purchased from the Publishing House for the Blind at Louisville, Ky.

As blind children are necessarily much more limited in the range of their occupations than those who see, it is essential that they have greater variety in their games and in their work, otherwise they grow weary and cease to be attentive.

It is the general opinion of those teaching the blind that the more nearly they can be trained as seeing children are and the fewer distinctive methods that are employed, the easier will it be for them to adjust themselves later in life to conditions that obtain among the seeing. At as early a period as possible in the child's life, he should be given an opportunity to play with other children of his own age. With a little supervision, he can be taught to enter into all of their games and to do a great many things that are done by seeing children. It is as true of the blind as it is of those who see that the most important elements in their education come not from teachers but from their associates. The effect of having a blind child among a group of seeing children is mutually helpful. If the children are properly taught, they will soon learn to supplement the lack of sight in their companion by giving him a little help when necessary. They will learn to tell him of things that are about him and describe the things as they see them, and in consequence they will learn how to observe and to express their thoughts, while he will quickly begin to form mental images, as far as he can form them, of his surroundings. It has seemed necessary up to the present time that special schools should be provided for the blind, but thoughtful students of pedagogy are beginning to believe that to have the blind in classes of seeing children is not infrequently of mutual advantage. During the period in which a school for the blind was undergoing repairs, a bright and ambitious pupil was taken temporarily into the class of a high school in a nearby city. When, after some months, he returned to his own school the superintendent, in speaking of this boy's work, said that his presence in the school had been of greatest help to the other lads with whom he had worked in class. His success in overcoming difficulties was a stimulus to their pride and an incentive to their ambition. His presence in class was a constant reminder to them of their superior physical advantages, and they were ashamed to have him outstrip them as he did in their intellectual work. The lad was of a gentle, kindly disposition and his fellow students emulated each other in showing little kindnesses to him, and he introduced thereby into the atmosphere of the school a quality of self-sacrifice, of courtesy and of chivalry, the effect of which was long continued. The added import-

ance of having blind children educated in connection with those who see is that they may realize more keenly the real difficulties of life which are to be met and which have to be overcome. They will not always find kindness and courtesy and they must be prepared to adjust themselves to the harder conditions when they arise.

Even for the younger children, special appliances for the ordinary conveniences of life are rarely necessary. They must eat at the common table, they must use the knives, forks, spoons and plates that other people use, and in the way that other people use them.

WRITING FOR THE BLIND.

The congenitally blind are rarely taught to write. It is a task requiring so much effort and is carried on with so much difficulty that the prevailing opinion seems to be that "the game is not worth the candle." Even a person with the high mental endowments of Helen Keller does not use her pen in writing, but prints her name in a scrawling fashion such as a seeing child of ten years might do. Moreover writing for the blind is rarely necessary because of the availability of the typewriter with its greater clearness and increased accuracy. The typewriter is now in use in all schools for the blind and is taught to all children who have sufficient intelligence to learn to read and write. From a legal standpoint, moreover, the possibility of merely signing one's name has no advantage for the blind man or woman, because not seeing the name after it is written it must be in any event attested by a witness, and his simple mark serves the purpose equally well. An ingenious French contrivance for correspondence between the blind and the seeing, has been devised, but has not yet been introduced in this country. It consists of double ended type, which can be easily set in a frame. On one side of the type is the point print letter, readily recognized by the finger tip, and on the other end the black Latin letter so that when the type is properly set on the one side by the blind writer the other presents the form of the ordinary Latin script, which can be ink rolled and then the impression taken from it, thus enabling the blind student to communicate with his friends who see. The seeing person on the other hand, can set up the type with the black letter surface uppermost, the frame being then removed and the paper put in position and pressed on the point print side. A raised impression is thereby produced which can be readily deciphered by the touch of the blind reader.

For those children who have at some period in their life had sight it is a rather different matter. Having at one time had fluency in the use of the pen, it is by no means difficult, with a little care, to continue to write without looking on the paper. A very simple arrangement can be made for this purpose consisting of a wooden slate having stripes on each side holding the paper in position, and a cross wire, which can be slipped down at regular intervals, to be used as a guide. At the end of this wire is a small knot which will indicate to the finger as the bell on the typewriter indicates to the typist when the end of the line is being reached. A stylographic pen should, of course, be used as it would be impossible for the blind writer to know when the ink had become exhausted. By using such a guide and with

a little care it is quite possible for the expert penman to write clearly and distinctly without seeing the paper.

A perusal of Dr. Lewis' article and of the various laws concerning the blind in the different states, brings to the surface certain fragmentary conclusions about blind people that seem to be noteworthy. For instance, the fact that even a *little* sight is of extreme value to blind people, and that every effort should be made to preserve even a fractional amount of vision. To those fortunate individuals who are blessed with an abundance of sight, the reduction of this sense, to a bare perception of shadows, or hand movements, seems almost useless. And yet, if this is all the vision possessed by a blind man, he cherishes it, as a miser cherishes his gold. It is of great value to him, in enabling him to get about, and to prevent his stumbling into objects, and it keeps up his courage wonderfully, as he feels he can see—at least, a little, and is not totally blind.

Every effort should be made to improve the general health of blind people. Being blind, they naturally seek quiet, and sedentary occupations, but this should be discouraged. The supreme and continuous effort of a blind man's life, should be to minimize his affliction as much as possible. He should be in the fresh air much of his time, should exercise, join in games and gymnastics, should receive all the education he will receive, should be thoroughly taught some useful, and—if possible, pleasant occupation, should have all his other senses, cared for and educated, should be taught to keep clean and attractive, in person, clothing, habits, etc., should learn self-reliance and self-helpfulness, should (if necessary) be supplied with the means, tools, etc., to establish himself in a business, profession or trade, should be assisted in disposing of manufactured articles, and should be made to realize that his product must be good and must sell on its merits and not because of charity or sympathy.

Blind people need friendly aid, cheerful surroundings, pleasant amusements and helpful companionship. They can do almost anything if properly educated. Not so well, of course, as seeing people, but very well indeed. The average blind worker is about 70 per cent. self-supporting. This is better than being *entirely* supported by the state, and it gives a blind person the blessing of useful occupation, and of an accumulating self-respect.

In Wood's Encyclopedia of Ophthalmology will be found a most excellent account of the blind institutions, etc., in the United States by Chas. F. F. Campbell. I have taken the liberty of utilizing this production, and contracting it to a small space, in order to

still further disseminate a knowledge of work for the blind in the various states. I have also added some facts of my own gathering. Campbell's article mentions all kinds of blind institutions and organizations, state, charitable, etc. In my own portion of this paper, which follows, I give no space to any blind institutions, organizations, etc., which are not organized by the state, and supported by the state. This series of papers is concerned merely in state laws.

ALABAMA.

Society for the Benefit of the Blind at Birmingham, to assist the blind to get technical education and find employment.

State Institution for the Deaf, Dumb and Blind at Talladega, for the technical education of children. J. H. Johnson, Supt.

Birmingham Association for the Blind, fourth floor City Hall building, Birmingham. Mrs. W. W. Bussey, Pres.; Miss B. E. Meyer, Secretary.

Alabama School for the Blind, Talladega. F. H. Manning, Supt.

School for the Negro Deaf Mutes and Blind, Talladega. J. S. Graves, Supt.

There is no commission for the blind. There are no laws concerning the blind.

Library for the Blind, Talladega; 1,100 volumes.

Library for the Blind, Montgomery; 88 volumes.

ARIZONA.

There is no commission for the blind. There is no State School for the blind.

A 1912 law empowers the State Board of Education to provide care, maintenance and instruction for blind babies and children under school age at the rate of \$1.00 per day. This continues until the child is six years old, or the Board may continue this until the child is twelve years of age.

ARKANSAS.

State School for the Blind at Little Rock. J. H. Hineman, Supt.; W. H. Hall, Chairman (Camden); J. Ferguson, Secretary (Magnolia). Supported by the State.

There is no commission for the blind. There is no society or committee.

Library for the Blind, Little Rock; 1,770 volumes.

CALIFORNIA.

Industrial Home of Mechanical Trades for the Adult Blind, 3601 Telegraph Avenue, Oakland. Supported by the State (at least mostly). Dormitory cost \$50,000. Fireproof, as it *should* be for the blind. Broom-making is the leading work, as usual for males. Occupation makes the blind happy. The female blind do best at fancy work, chair caning and whisk broom making. J. P. Irish, Pres. (Oakland); G. S. Meredith, Sec.; J. Sanders, Supt. (blind man).

Institution for the Deaf, Dumb and Blind, Berkeley. L. Jenks, Pres.; L. E. Milligan, Supt. Supported by the State.

California Society for the Prevention of Blindness. Dr. C. S. G. Nagel, Pres., 209 Post Street, San Francisco; Dr. N. Perry, Sec., 2808 Derby Street, Berkeley.

San Francisco Association for the Blind, 1526 California Street, San Francisco. Mrs. M. Friedman, Pres. Has a reading room and library. The blind are here read to and entertained. They assist the adult blind. They make baskets, brooms, etc. It is supported by voluntary contributions.

There is no commission for the blind.

The Legislature of 1915 provided that blind graduates of the State School for the Blind at Berkeley, attending the University of California or any other State Normal School, may have text books read to them at State expense, to the extent of \$300 per annum per person. The fund is under the control of the Board of Directors of the State School for the Blind. A 1913 law (Legislature) employs a home teacher for the blind.

Library for the Blind, Berkeley, 1,500 volumes.

Library for the Blind, Sacramento, 3,600 volumes.

Library for the Blind, San Francisco, 400 volumes.

COLORADO.

There is a State School for the Blind and Deaf at Colorado Springs. W. K. Argo, Supt. There are trustees. They do much poultry raising. Supported by the State.

Industrial Workshop for the Blind, 618 E. Arizona Avenue, Denver. Partly supported by the State.

There is no commission for the blind.

The Legislature of 1913 provided instruction for blind adults at their homes. This is under the State Superintendent of Public Instruction.

Library for the Blind, Colorado Springs, 1,100 volumes.

CONNECTICUT.

Connecticut Blind People's Association, Meriden. F. G. Comstock, Pres.

Connecticut School for the Blind, Hartford. Geo H. Marshall, Supt.

Connecticut Institute and Industrial Home for the Blind, Hartford. Miss L. Russell, Supt. for nursery for blind babies; G. H. Marshall, Supt. for school department; R. E. Colby, Supt. trades department. Partly supported by the State.

Connecticut Kindergarten for the Blind, Farmington.

There is a State Commission for the Blind.

At the New Haven Normal School of Gymnastics lectures on the eyes are given by Dr. Blake. Instruction is given as to how school tests for eyes, etc., can be made by teachers.

Legislature of 1913 created a State Board of Education for the Blind, consisting of the Governor, Chief Justice and two other members appointed by the Governor. This Board has general supervision of the blind in the State. It is the only State doing this. It allows \$300 a year for the instruction and training of all blind people recommended by the Board.

Library for the Blind, Hartford.

DELAWARE.

There is a State Commission for the Blind at Wilmington, for industrial purposes only. C. R. Van Trump, Chairman; D. Snellenburg, Sec., 305 W. 8th Street. Partly supported by the State. The Commission operates a "Blind Shop" at 305 W. 8th Street, Wilmington, and employs about 20 men, who earn their living. The Blind Shop has a free library, 772 volumes. They make rugs and carpets, brooms, chair caning, baskets, knitting and crocheting, and do piano tuning.

There is no asylum for the blind. The State pays no adequate pension. It pays blind people \$3.00 a week for two years to pay expenses of teaching a trade.

DISTRICT OF COLUMBIA.

Columbia Polytechnic Institute for the Blind, 1808 H Street N. W., Washington. R. W. Swann, Manager. They do much printing. It is supported by voluntary contributions.

Aid Association for the Blind, 3050 R Street N. W., Washington. Home and workshop; both sexes; white and colored. Supported by voluntary contributions.

District of Columbia Association of Workers for the Blind. F. F. Hufty, Pres., 1808 H Street N. W., Washington. The active members are blind.

National Library for the Blind, 1729 H Street N. W., Washington.

The Library of Congress, Department for the Blind.

FLORIDA.

Institution for the Deaf and Blind, St. Augustine. A. H. Walker, Supt. Partly supported by the State.

There is no commission for the blind.

Library for the Blind, St. Augustine; 175 volumes.

GEORGIA.

Georgia Academy for the Blind, Macon. A. L. Miller, Pres.; T. D. Tinsley, Sec.; G. F. Oliphant, Supt. This academy gives a four-year course, both charity and pay. It admits people between the ages of seven and twenty-five. It receives poor pupils from each county. Trustees are appointed by the Governor. Also ten visitors are appointed by the Governor. Partly supported by the State. A receiver in each county keeps a record of the number of blind between the ages of seven and twenty-five. These are sent annually to the Comptroller General. He sends the names to the Trustees. Each county has a Board of Health. They elect a County Health Officer. He visits the schools annually, examines teachers and pupils and delivers lectures. He examines the pupils for eye, ear, nose and throat diseases. About eight out of 148 counties do this. Local inspectors do the same.

There is no commission for the blind, no society for the blind. The State pays no pension to the blind.

Library for the Blind, Macon; 2,500 volumes.

IDAHO.

State School for Deaf, Dumb and Blind at Gooding. W. E. Taylor, Supt. Under State Educational Commission. E. O. Sisson, Chairman (Boise). Partly supported by the State.

There is no commission for the blind, no society for the blind. The State pays no pension to the blind.

Library for the Blind, Gooding; 200 volumes.

Indigent blind people are cared for by the State to the extent of \$180 per annum.

ILLINOIS.

Illinois Charitable Eye and Ear Infirmary, 904 W. Adams St., Chicago. J. L. O'Connor, Supt.

Industrial Home for the Blind, 1901 Marshall Boulevard, Chicago. W. F. Schultz, Supt. Workshop for the blind, supported by the State.

Illinois School for the Blind, Jacksonville, Ill. H. C. Montgomery, Supt. Supported by the State.

Illinois Society for the Prevention of Blindness, 30 N. Michigan Boulevard, Chicago. C. L. Hutchinson, Pres.; Miss C. C. Van Blarcom, Sec.

Board for the Visitation and Instruction of Adult Blind, 31 S. Sacramento Boulevard, Chicago. C. E. Comstock, Supt.

Co-education of the Blind and the Seeing. J. B. Curtis, Supervisor. Chicago was the first city in America to educate blind and seeing children together. The move was begun in 1900.

Visitation and Instruction of the Adult Blind, 5618 Drexel Avenue, Chicago. Chas. E. Comstock, Supt. Visits and instructs blind people and sells their products.

The State pays the adult blind (properly qualified) \$150 per annum. Each county pensions its own blind.

There is no commission for the blind.

The Chicago Public Library has 1,450 volumes for the blind. Jacksonville has 4,500 volumes for the blind.

INDIANA.

Institution for the Education of the Blind, Indianapolis. Geo. S. Wilson, Supt. Supported by the State.

Board of Industrial Aid for the Blind, Indianapolis. C. D. Chadwick, Executive Sec. Similar to a State Commission.

Indiana Association of Workers for the Blind, Indianapolis. B. F. Smith, Pres., 125 West Fall Creek Boulevard, Indianapolis. Supported by voluntary contributions. This institution does all kinds of work for the blind and for the prevention of blindness. The State provides readers for blind students.

There is no commission for the blind. The State Board of Charities and Correction looks after all such matters.

The library at the School for the Blind in Indianapolis contains 2,075 volumes.

The State Library at Indianapolis contains 640 volumes.

IOWA.

State College for the Blind, Vinton. Under State Board of Education. Supported by the State. Geo. D. Eaton, Supt.

Iowa Association for the Blind, Des Moines. Mrs. J. B. Jordan, Pres. (Vinton).

The State Medical Society has a Conservation of Vision Committee. Dr. H. G. Langworthy, Chairman (Dubuque).

Home for Sightless Women, 1424 30th St., Des Moines. Mrs. E. A. Whitcomb, Sec. This institution has no State aid.

There is no commission for the blind.

There is a State pension for the blind of \$150 a year to those whose income is under \$300 a year, paid by counties.

Library for the Blind, Des Moines, 270 volumes.

Library for the Blind, Vinton, 3,790 volumes.

KANSAS.

State Blind School, Kansas City, Kansas; teaches literary work and trades. Mrs. Grace N Roseberry, Supt. Supported by the State.

There is no commission for the blind. The State pays a pension to the blind. The State pays for readers for the blind.

Library for the Blind, Kansas City; 330 volumes.

KENTUCKY.

State Society for the Conservation of Vision, Lexington. J. A. Stucky, Pres.; Miss Linda Neville, Sec. No State aid.

Institute for the Blind, Louisville. Visiting board is appointed by the Governor. Supported by the State. This institution admits people of the ages from six to twenty-one years. Susan B. Merwin, Supt.

Kentucky Workshop for the Blind. C. B. Martin, Supt. No State aid.

The Mountain Fund. Supported by voluntary contributions. This affords means to enable eye sufferers in the mountains to secure expert treatment. Miss Linda Neville, Manager (Lexington).

American Printing House for the Blind, Louisville. Does printing for the blind.

There is no commission for the blind.

Library for the Blind, Louisville Free Public Library, 300 volumes.

Library for the Blind at the Institution for the Blind, Louisville, 2430 volumes.

LOUISIANA.

Louisian State Commission for the Blind, New Orleans. This is not a State affair. It is a private association. Rev. A. O. Brown, Pres. (Y. M. C. A., New Orleans); Mrs. R. L. Skinner, Sec. (6222 Louisa St., New Orleans); Dr. J. W. Newman, Vice-Pres. Dr. Newman is also Chairman of the section for the Prevention of Blindness of the State Medical Society.

Institution for the Blind, Baton Rouge. G. C. Huckaby, Supt. Supported by the State.

St. Beatrice Circle of St. Margaret's Daughters, New Orleans. Supported by voluntary contributions. To work for and instruct the blind. Mrs. F. D. Ross, Pres., 917 Washington Ave., New Orleans.

Library for the Blind, Baton Rouge, 800 volumes.

MAINE.

Maine Institute for the Blind, 199 Park Avenue, Portland. M. F. Baldwin, Supt. Partly supported by the State.

Friendly Society of Blind People. This is for their personal benefit. F. Barker, Pres. (Gardiner); C. DeBack, Sec. (Portland).

The State gives \$1.00 a day to blind children, under school age, for

their care, maintenance, education, etc., if the parents are unable to do so.

The State (since 1915) gives through the Governor and Council \$200 a year to all blind persons over 21 years of age who are not in charitable or penal institutions. Their income must be less than \$300 a year. Doctors are allowed \$2.00 to examine such patients.

There is no society or committee for the blind. There are no laws concerning the blind, and no commission for the blind.

The Public Library in Portland is well supplied with books for the blind.

MARYLAND.

Maryland Society for the Prevention of Blindness, Baltimore. J. Packard, Pres.; J. J. Carroll, Sec. (405 N. Charles St., Baltimore). No State revenue.

Maryland Association of Workers for the Blind, Associated Blind Men of Maryland, Associated Blind Women of Maryland, 501 W. Fayette St., Baltimore. Mrs. C. Masbach, Sec. They help to raise money for the blind.

Maryland Workshop for the Blind, 501 W. Fayette St., Baltimore; Mr. Connor, Supt. Partly supported by the State and the City of Baltimore.

School for the Blind, Overlea; J. F. Bledsoe, Supt. Partly supported by the State.

School for the Colored Blind and Deaf Mutes, Overlea. J. F. Bledsoe, Supt.

Home Teaching, Baltimore. Miss V. Kelly, Supervisor. Teaches the blind at homes and factory and disposes of their work.

Library for the Blind, Baltimore, 1,760 volumes.

Library for the Blind, Overlea, 3,680 volumes.

There is no pension for the blind.

There is a State law requiring blind children between the ages of 6 and 16 to attend a school for the blind.

There is a "State Commission for Improving the Condition of the Adult Blind." It is its duty to investigate the condition of the blind and may furnish money for the relief of individual cases.

MASSACHUSETTS.

Perkins Institution and Massachusetts School for the Blind, Watertown. E. E. Allen, Supt. Partly supported by the State.

Howe Memorial Press, Perkins Institution. Prints literature, etc., for the blind. F. C. Bryan, Manager.

State Home-Teaching for the Adult Blind. Under supervision of the Perkins Institution. Partly supported by the State. It teaches the blind in their homes. J. Vars, Principal.

Perkins Institution Workshop, 549 East 4th Street, South Boston. Salesroom, 383 Boylston Street, Boston. No state aid. Principal industries are mattress making and chair caning. F. C. Bryan, manager.

Massachusetts Association for Promoting the Interests of the Blind, Cambridge.

Boston Nursery for Blind Babies, 147 S. Huntington Avenue, Roxbury. No State aid. Miss J. A. Eussell, Supt.

Worcester Memorial Home for the Blind, 81 Elm Street, Worcester. Supported by voluntary contributions. (For blind women.) Miss B. Rice, Matron.

State Commission for the Blind, started in 1906. This covers (under amendment) prevention and conservation of work. J. P. Monroe, Chairman, 3 Park Street, Boston. This commission operates workshops in Pittsfield, Lowell, Worcester, Fall River and Cambridge. They make mattresses, chair caning, rugs, mops, willow ware, etc.

Outlook for the Blind. A publication for the blind. S. E. Allen, Sec. Perkins Institution.

Libraries for the Blind: Boston, 1,052 volumes; Brookline, 100 volumes; Lynn, 255 volumes; New Bedford, 214 volumes; Watertown, 13,999 volumes; Worcester, 295 volumes.

MICHIGAN.

Blind People's Welfare Association. Miss R. Griffith, Pres. (800 Clancy Street, Grand Rapids); Floyd Waite, Sec. (Grand Rapids).

Grand Rapids Association for the Blind. Miss E. Griffith, Sec, 800 Clancy Avenue N. E., Grand Rapids.

School for the Blind, Lansing. C. E. Holmes, Supt. Supported by the State.

Co-education of the Blind and the Seeing in the Public Schools of Detroit. Begun in 1912. Teacher in charge, Fannie S. Fletcher.

State Aid for Blind Babies. The State Board of Education is authorized by the State to care for and educate blind children under school age, whose parents cannot do it. They may pay not to exceed \$5.00 a week. Bill passed in 1913.

Employment Institution for the Blind, Saginaw. Teaches trades for the blind. F. G. Putnam, Supt. Supported by voluntary contributions.

Home for Blind Babies, Monroe. Mrs. M. O. Laughlin, Matron. Supported by voluntary contributions.

There is no commission for the blind.

Libraries for the Blind: Detroit, 222 volumes; Lansing, 3,735 volumes; Saginaw, 2,500 volumes.

MINNESOTA.

The State Institutions for the Blind, Deaf and Feeble-Minded at Faribault are under State control and support. J. J. Dow, Supt.

Minneapolis Society for the Blind, 206 S. 4th Street, Minneapolis. J. C. Vance, Pres.; Miss E. H. Marsh, Sec.

Summer School for the Blind, Faribault. J. J. Dow, Supt. Teaches blind men and women during the summer months.

Field and Employment Agency for the Blind, Faribault. Supported by the State. J. J. Dow, Supt.

Higher Education Aid. Three hundred dollars a year is given to a few blind students in schools. This is done under the direction of the Board of Directors of the Minnesota School for the Blind, and the money is furnished by the State.

State Aid for Blind Infants. The State Board of Control cares for and educates blind children under school age.

There is no commission for the blind.

Library for the Blind, Faribault, 4,000 volumes.

MISSISSIPPI.

State School for the Blind, Jackson. Dr. R. S. Curry, Supt. Here the blind are educated in arts and literature. Supported by the State.

Library for the Blind, Jackson; 1,000 volumes.

MISSOURI.

St. Charles Association for the Blind, St. Charles. Miss A. A. Ruenzi, Pres. (Blind); Mrs. E. M. Salvator, Sec.

Missouri Association for the Blind, 703 Metropolitan Building, St. Louis. R. Johnston, Pres.; Mrs. Anna F. Harris, Sec. Organized 1911. It has a workshop at 1624 N. Jefferson Avenue, where 50 men are employed. The shop earns 70% of its expenses. Broom making is the most important industry. Supported by voluntary contributions.

The United Workers for the Blind, 2616 Gamble Street, St. Louis. J. Unterberger, Pres., 6033 Westminster Street, St. Louis. For blind men. They help the sick who are blind, pay funeral expenses and procure pensions. They publish *The World of the Blind*.

Missouri School for the Blind, 19th and Morgan Streets, St. Louis. M. Collins, Pres.; O. Hammer, Sec.; S. M. Green, Supt. Supported by the State.

Blind Girls' Home, 5235 Page Boulevard, St. Louis. This was started by blind girls and is a charitable institution.

A commission for the blind was created March 13, 1915, by legislature. Members are appointed by the Governor. Partly supported by the State. J. D. P. Francis, Pres.; J. C. Jones, Sec.

The Missouri Commission for the Blind has a county organization in 97 counties; each has a county chairman who is a member of the Missouri State Medical Society. Dr. W. H. Luedde of St. Louis is the Chief Medical Officer. Supported by voluntary contributions.

State Aid for College Students. In 1913 a law was passed whereby blind students desiring higher education may be assisted by the State to the extent of \$300 per annum. He must show that neither he, his parents nor guardian can pay for a reader.

There is a pension for the blind.

Libraries for the Blind: St. Louis, 490 volumes; St. Louis School for the Blind, 4,760 volumes.

MONTANA.

School for the Blind, Helena. Under the State Board of Education.

State School for the Deaf and Blind at Boulder. H. J. Menzemer, Pres. Admits people to the age of twenty-one. Supported by the State.

There is no commission for the blind.

Library for the Blind, Boulder; 190 volumes.

NEBRASKA.

Institution for the Blind, Nebraska City. N. C. Abbot, Supt. Supported by the State.

Nebraska Commission for the Blind, Nebraska City. N. C. Abbott, Supt. This is under the Board of Commissions of State Institutions. The Advisory Board is the executive. The Commission has a Superintendent and a Field Agent. Supported by the State.

Committee of the Nebraska Association of Workers for the Blind. L. A. Harris, Pres.; E. C. Cook, Sec.

Library for the Blind, Nebraska City; 4,000 volumes.

NEVADA.

There is no society, commission or school for the blind.

The State pays no pension to the blind.

NEW HAMPSHIRE.

There is a so-called New Hampshire Association for the Blind. Rev. A. M. Dunstan, Pres. (Tilton). This provides industrial pursuit for the blind. Supported by voluntary contributions.

Legislature for 1913 passed laws for assisting the adult blind. Under control of the State Board of Charities and Corrections. H. J. Van Vliet, Supt. Five thousand dollars was appropriated for the purpose.

There is no incorporated society and no state commission. The State Board of Charities and Correction looks after such matters. It provides for the education and maintenance of blind children in special schools. It assists the adult blind to receive training in their homes or in industrial schools for the blind. It sells the product of the blind.

There is a pension for the blind. Law of 1915. The County Treasurer's fund may be drawn upon to the extent of \$150 a year for each blind person in need.

Libraries for the Blind, Concord, State Library; Manchester, City Library.

NEW JERSEY.

The Committee for the Purpose of Ameliorating the Condition of the Blind: W. F. Morgan, Pres. (Short Hills); Mrs. E. P. Earle, Sec. (Montclair); Lydia Y. Hayes, Supervisor (Newark). Supported largely by the State. This is a State Commission.

New Jersey State Commission for the Blind, 54 James Street, Newark: Miss A. I. Wood, Sec.; Mrs. A. T. Beckitt, Pres.

St. Joseph's Home for the Blind, Pavonia Ave., Jersey City. School classes for the blind in New Jersey. Head teacher, Miss J. G. Patterson, 8 S. Arlington Ave., East Orange. Jersey City teacher, Miss C. M. Croff, 14 Madison Ave., Jersey City. Sister M. Gertrude, Supt. Supported by voluntary contributions.

Trenton Association of Workers for the Blind, New Jersey. S. Van Hise, Pres., 127 Perry Street, Trenton; Mrs. J. S. Crosland, Sec, 108 Centre Street, Trenton.

Camden County Association of Workers for the Blind of New Jersey. W. Tushingham, Pres., *Courier* office, Camden; Mrs. E. Robinson, 314 Elm Street, Camden, Sec. Its purpose is to promote the interests of the blind.

New Jersey Blind Men's Club, Newark. W. Blunt, Pres., 175 N. Maple Street, East Orange; W. J. Adickes, Sec., Hoboken.

New Jersey State Association for the Blind. W. J. Dawson, Pres., 1028 Broad St., Newark; Miss L. Y. Hayes, Sec., 217 Walnut St., Montclair.

The Lighthouse, conducted by the Trenton Auxiliary for the Indus-

trial Blind, 346 S. Warren St., Trenton. Mrs. H. F. Andrews, Pres.; Mrs. J. D. Williamson, Sec.

New Jersey Federation of Associations of Workers for the Blind, Trenton. C. H. Mumby, Pres., 226 Broadway, Bayonne; D. J. O'Brien, Jr., Sec., 776 Grand St., Jersey City. This organization unites several blind associations.

New Jersey Progressive Blind Men's Society, Jersey City. C. H. Mumby, Pres., 226 Broadway, Bayonne; L. P. Schuerman, Sec., 69 Bayview Ave., Jersey City.

Amelioration Association for the Blind. J. D. O'Brien, Jr., Pres., 776 Grant St., Jersey City; Miss E. M. Brown, Sec., 54 Siedler St., Jersey City.

Arthur Home for Blind Babies, Summit. Miss A. Welch, Supt. Supported by voluntary contributions.

Home of Our Lady of Perpetual Help for the Blind, Bayonne. Home and school for the blind. Sister Rosalie, Supt.

New Jersey Association for the Blind, Montclair. Promotes the interests of the blind. Rev. W. J. Dawson, Pres.

Trenton Auxiliary for the Industrial Blind, 346 S. Warren St., Trenton. Mrs. H. F. Andrews, Pres.

New Jersey pays for the education of blind children in institutions in other States.

The blind and seeing children are educated together in the public schools of Newark and Jersey City.

New Jersey pays \$450 a year for the care, education, etc., of blind children under school age who are in need.

NEW MEXICO.

State Institution for the Blind, Alamogordo. R. R. Pratt, Supt. Supported by the State.

There is no commission for the blind.

Library for the Blind, Alamogordo, 500 volumes.

NEW YORK.

New York Guild for the Jewish Blind, New York City. E. B. Levy, Pres., 736 West End Ave.

Hebrew Association for the Blind, 261 Broadway, New York City. B. Berinstein, Pres.; Miss R. Stern, Sec.

Albany Association for the Blind, 31 Elk St., Albany. Mrs. Mary V. Hun, Sec.

The Cayuga County Association for the Blind, Merrifield. A. E. Bigelow, Pres.; Mis H. E. Bigelow, Sec.

The Rochester Association of Workers for the Blind, Rochester. Mrs. A. Allen, Pres. (2 Olive St.); Mrs. S. Davis, Sec. (87 Troup St.).

Utica Association for the Blind, Utica. J. R. Proctor, Chairman; Miss A. Connelly, Sec. Supported by voluntary contributions.

Council of Jewish Women, New York City. Mrs. W. Sperhorse, Pres. (Hawthorne Ave., Parchester); Mrs. C. Rosenstein, Chairman of the Committee for the Jewish Blind (564 W. 160th St., New York).

New York Association for the Blind. (The Lighthouse), 111 E. 57th St., New York City. Miss W. Holt, Sec. Supported by voluntary contributions and an endowment.

Golden Rule Alliance of America, 75 5th Ave., New York. Fanny J. Crosby, Pres.; Mabel F. Holman, Sec.

Institution for the Blind, New York City. C. B. Tewksbury, Supt.

New York Institute for the Education of the Blind, 34th and 9th Ave., New York. E. M. Van Cleve, Principal. Supported by the State and its own income.

State School for the Blind, Batavia. C. A. Hamilton, Supt. Supported by the State.

Catholic Institute for the Blind, 175th St. and University Ave., New York. Sister M. Bertrand, Supt. Supported by the city and voluntary contributions.

Headquarters for the Blind, 267 Schermerhorn St., Brooklyn. T. J. Riley, Supt. Supported by voluntary contributions.

Department for the Blind. C. B. Hayes, Supt. Teaches the blind and sells their work.

New York Federation of Workers for the Blind, Batavia. C. A. Hamilton, Sec. For helping the condition of the blind.

Central Council of Workers for the Blind, New York. A clearing house for work for the blind. C. B. Hayes, Pres.

New York Blind Aid Association, 442 W. 35th St., New York. A relief organization for the blind.

Blind Babies' Mothers' Association, 66 Broadway, New York. Its purpose is to help the blind and their parents. F. H. Jerome, Sec.

Brooklyn and Queens Blind Welfare Society, 3 S. Elliott Place, Brooklyn. A blind association to help the blind. E. Tyson, Pres., 291 Nosstrand Ave., Brooklyn.

The Manhattan and Bronx Blind People's League, 379 E. 15th St., New York. E. Heil, Sec. For the benefit of the blind.

Mispah Circle, 516 Gates Ave., Brooklyn. Miss M. Braun, Sec. For helping blind people.

City Home, Blackwell's Island, New York. For the poor blind. Supported by the city.

Home for the Relief of the Destitute Blind, 104 St. and Amsterdam Ave., New York. Mrs. M. J. Brown, Matron.

Home for the Blind, 550 Washington Ave., Brooklyn.

Home for Christian Episcopalian Blind Women. Miss A. L. Hodgkiss, Supt. Supported by the Episcopalian Church. Entrance fee, \$250.

King's County Almshouse, Brooklyn. Instruction and entertainment is here given to the blind.

St. Joseph's Blind Asylum, Staten Island, New York. For blind girls and women. Sister Superior, Sister M. Ann. Supported by voluntary contributions.

New York State and New York City Aid for Blind Babies and Children. The commissioner of education may send blind children to certain institutions and pay \$1.00 a day for their support.

International Sunshine Home for Blind Babies, Dyker Heights, 84th St. and 13th Ave., Brooklyn. Supported by voluntary contributions.

Albany Association for the Blind, 105 Lancaster St., Albany. F. L. Fros, Pres. Its purpose is to teach industries to the blind. Supported by voluntary contributions.

Buffalo Association for the Blind, 489 Ellicott St., Buffalo. J. E.

Eldridge, Supt. Teaches industries to the blind. Supported by voluntary contributions.

Syracuse Association of Workers for the Blind, Y. M. C. A. Bldg., Syracuse. Supported by voluntary contributions.

Tri-County Association for the Blind, Glen Falls. Mrs. R. W. Sherman, Treasurer.

Tuning School, 357 E. 49th St., New York. Teaches the blind piano tuning.

Bourne Workshop for the Blind, 338 E. 35th St., New York. D. Killinger, Supt.

Industrial Home for the Blind of Brooklyn, 512 Gates Ave., Brooklyn. E. P. Morford, Supt. Supported by voluntary contributions.

Recently the New York State Committee for the Prevention of Blindness (Miss L. L. Schuyler, Chairman) and the American Association for the Conservation of Vision, merged and made one body—the National Committee for the Prevention of Blindness, 130 E. 22nd St., New York. E. M. Van Cleve, Managing Director; Miss Marion A. Campbell, Office of the National Committee. The New York State Committee retains its identity and scope of action, but is no longer an independent organization.

There is also a New York State Commission for the Blind, 105 W. 40th St., New York. Miss M. Campbell, Sec. Its purpose is to improve the condition of the blind. The commission is under State control and members are appointed by the Governor. State appropriation, \$3,000 a year.

The blind and seeing are educated together in the public schools. Miss F. E. Moscrip, Supervisor.

The State provides \$300 a year for each needy blind person attending Universities. Law of 1907.

New York City provides \$100 a year to needy blind people. There is no state pension for the blind.

The Matilda Ziegler Magazine for the Blind, 250 W. 54th St., New York. W. G. Holmes, Pres.

Libraries for the Blind: Albany, 3,975 volumes; Auburn, 100 volumes; Batavia, 4,750 volumes; Brooklyn, 2,255 volumes; Buffalo, 100 volumes; New York Institute for the Education of the Blind, 3,800 volumes; New York Public School Classes for the Blind, 200 volumes; New York Public Library, 8,000 volumes; Rochester, 50 volumes.

NORTH CAROLINA.

North Carolina Association of Workers for the Blind, Raleigh. All blind people. H. G. Easley, Pres. (High Point); Miss F. E. Fleming, Sec. (Hester). Incorporated 1913.

North Carolina Institution for the Blind, Deaf and Dumb, Raleigh. Supported by the State.

Society for the Prevention of Blindness. J. E. Ray, Sec. Officers are appointed by the State Medical Society. It is not incorporated, has no charter and is not under State government.

North Carolina Association of the Blind, Greensboro. An industrial home for needy blind women. H. C. Easley, Pres.

There is no commission for the blind.

Library for the Blind, Raleigh, 3,500 volumes.

NORTH DAKOTA.

State School for the Blind, Bathgate. B. P. Chapple, Supt. Supported by a fund supplied by the United States and the State of North Dakota.

State Aid for the Blind. The Legislature in 1913 passed a bill providing for the support, education, etc., of blind children under school age. The money is supplied to the State Board of Control.

There is no commission for the blind.

Library, Bathgate; 770 volumes.

OHIO.

Cleveland Society for the Blind, 612 St. Clair Ave. North, Cleveland. Mrs. E. B. Palmer, Sec. This society helps the blind in many ways. Supported by voluntary contributions.

Cleveland Society for the Blind, 1906. Teaches occupations to the blind.

Home Publishing Society for the Blind, Cleveland. Provides literature for the blind. R. B. Irwin, Pres., 1443 E. 3rd St., Cleveland.

Dayton Association for the Blind, 1907. Mrs. E. F. Barney, Pres. Its purpose is to promote the general welfare of the blind.

State Aid for College Students, 1913. Furnishes readers to college students.

Ohio State School for the Blind, 1837, Columbia. C. F. F. Campbell, Supt. The plant is valued at \$800,000. Supported by the state. Annual appropriation, \$100,000.

Ohio State Medical Association, Committee for Conservation of Vision. Dr. G. C. Schaeffer, Chairman (Columbus).

Clovernook Home for the Blind, Mt. Healthy, Ohio. For blind women, mostly of advanced age. Entrance fee, \$300 for those able to pay.

Cincinnati Association for Welfare of Blind, 1911, 1506 Bremen St. C. F. Kuhn, Supt. Teaches basket making, brooms, etc.

Commission for the Blind appointed by the governor, 1908. Partly supported by the State. They look after legislation for the blind, prevention of blindness, they employ special public eye nurses, look after the instruction of the blind, teaching of occupations, disposal of goods of the blind, deliver lectures on conservation of vision, distribute printed matter, etc. 335 S. High St., Columbus. M. E. Miskall, Pres. (East Liverpool); C. F. F. Campbell, Sec. (Columbus).

Cincinnati Library Society for the Blind, 1901. Provides reading, entertainment, visits, aid, medical service, clothing, etc., to the blind. 2,200 volumes.

A law passed 1908 provides for pensions to be paid to blind people, not to exceed \$150 a year to any person. Money is distributed through the commissioner in each county. In order to receive a pension, persons must be blind, must reside in county one year and must have become blind while a resident of the State, or have been a resident at the time of the passage of the act. The pension is granted to the needy and those who, unless given this relief, would become a charge upon the public. About \$400,000 distributed annually.

The blind and the seeing children are educated together in some

of the Cincinnati, Cleveland and Toledo public schools. R. B. Irwin is the director in all these schools.

In 1913 Ohio passed a law providing means to furnish readers to blind people desiring to become educated in colleges, universities, etc. They must be unable to pay for this themselves and must be recommended by the State School for the Blind and the State Board of Administration. The amount that may be paid is not specified.

The State pays a pension to the blind.

Libraries for the Blind: Cincinnati, 2,200 volumes; Cleveland, 690 volumes; Columbus.

OKLAHOMA.

School for the Blind, Muskogee. There is legislation concerning the establishment and maintenance of this place. O. W. Stewart, Supt. Supported by the State.

There is no commission for the blind.

Library for the Blind, Muskogee, 2,000 volumes.

OREGON.

Oregon State School for the Blind (1873) Salem. Under State Board of Control. The members consist of the Governor, Secretary of State and State Treasurer. E. T. Moores, Supt. Supported by the State.

Workshop for the Adult Blind, 11th and Davis Sts., Portland. J. F. Meyers, Supt. This is an industrial institution and is maintained by the City of Portland.

There is a State Committee for the Conservation of Vision and Prevention of Blindness, appointed by the State Medical Society.

There is no commission for the blind.

The State pays no pension to the blind.

Libraries for the Blind: Portland, 160 volumes; Salem, 600 volumes.

PENNSYLVANIA.

Pennsylvania Association for the Blind, Liberty and Second Ave., Pittsburgh. W. Stamm, Sec. Teaches industries to blind women and sells their products. Supported by the State, by endowment, donations and the City of Pittsburgh.

Institution for the Instruction of the Blind, Overbrook, Philadelphia. O. H. Burritt, Supt. Supported by endowment, tuition fees and the State.

Western Pennsylvania Institution for the Blind, Pittsburgh. J. S. McAloney, Supt. Supported by endowment and the State.

Salesroom and Exchange for the Blind, 204 S. 13th St., Philadelphia. L. Delfino, Supt.

State Aid for Blind Infants. By an act of Legislature passed in 1913, the State Board of Education may order the payment of \$1.00 a day to care for and educate blind children under eight years of age.

Pennsylvania Working Home for Blind Men, 3518 Lancaster Ave. W., Philadelphia. Supported by the State and the city. This is a home and workshop for adult blind men. F. H. Mills, Supt.

Pennsylvania Industrial Home for Blind Women, 3827 Powelton Ave. W., Philadelphia. This is a home and workshop for adult blind women. Miss A. V. Harry, Supt.

Pennsylvania Home Teaching Society and Free Circulating Library for the Blind, Witherspoon Bldg., Philadelphia. Mrs. I. W. Kennedy, Sec. Supported by the State, endowments and donations.

Blind Relief Fund of Philadelphia, Witherspoon Bldg. Its purpose is to furnish outings and help to the blind. Supported by voluntary contributions.

Chapin Memorial Home for the Aged Blind, 6713 Woodlawn Ave., Philadelphia. Supported by endowment and donations. An admission fee of from \$300 to \$500 is charged. Mrs. A. B. Reibold, Matron.

Pittsburgh Workshop for the Blind, Liberty St. and Second Ave., Pittsburgh. W. H. Long, Supt. Supported by the City of Pittsburgh and private donations.

Blind Women's Progressive Club. Miss E. Johnson, Pres. Supported by membership fees and contributions.

Society for the Promotion of Church Work among the Blind, 533 Arch St., Philadelphia. W. A. Warner, Treasurer.

Commission on the Conservation of Vision. Dr. W. W. Blair, Chairman. Under the auspices of the State Medical Society.

There is no commission for the blind.

Libraries for the Blind: Philadelphia Free Library, 5,570 volumes; Philadelphia Overbrook, 19,950 volumes; Pittsburgh Carnegie Library, 2,630 volumes; Pittsburgh School for the Blind, 1,000 volumes.

RHODE ISLAND.

Home Teaching for the Adult Blind. Supported by the State.

State Aid for Blind Infants and Youths. The State pays \$1.00 a day for the care and education of poor blind infants and children under school age. When children are old enough to attend a blind school in a neighboring State, the State will pay the necessary expenses.

There is no commission for the blind.

SOUTH CAROLINA.

South Carolina Institution for the Education of the Deaf, Dumb and Blind, Cedar Springs. N. F. Walker, Supt. Supported by the State.

There is no commission for the blind.

Library for the Blind, Cedar Springs, 1,000 volumes.

SOUTH DAKOTA.

State School for the Blind, Gary. Lelia M. Curl, Supt. Under State Board of Charities and Correction. This school has seven instructors and 27 pupils. Supported by the State.

State Aid for Blind Infants. The State will pay \$1.00 a day for blind and poor children under school age. The State will also pay the necessary expenses to send children to blind schools outside of the State.

There is no commission or society for the blind.

Library for the Blind, Gary, 1,320 volumes.

TENNESSEE.

School for the Blind, Nashville. J. V. Armstrong, Supt. Supported by the State.

Home for Blind Women, Nashville. Supported by the State and private donations.

Committee for the Blind. Mrs. J. P. Frank, Chairman (Nashville). This acts in conjunction with the National Committee for the Prevention of Blindness. A bill has been passed for the prevention of blindness.

A State Commission is appointed by the Governor.

Tennessee Commission for the Blind. President, Mrs. J. P. Frank, Montrose Ave., Nashville. Secretary, Mrs. B. Fensterwald, Nashville Library for the Blind, Nashville, 6,000 volumes.

TEXAS.

State Institution for the Blind, Austin. E. E. Bromlett, Supt. Supported by the State.

Institution for the Deaf, Dumb and Blind Colored Youth, Austin. J. H. Stewart, Supt.

There is no commission for the blind.

Library for the Blind, Austin, 7,500 volumes.

UTAH.

University of Utah (Department for the Blind), Ogden. F. M. Driggs, Supt. Supported by the State.

A commission for the blind was created in 1909 and was later abandoned.

Libraries for the Blind: Ogden, 5,050 volumes; Salt Lake City, 190 volumes.

VERMONT.

Austine Institution, Brattleboro. Dr. H. D. Holton, Pres.; Miss H. G. Throckmorton, Principal. This is an institution for blind and deaf children. Partly supported by the State.

Vermont Association for the Blind. President, Mrs. G. W. Wales, Burlington. Supported by voluntary contributions.

Vermont Association for the Blind (Chittenden Co. Branch). Miss M. S. Smith, Treas., 189 N. Winooski Ave., Burlington.

There is no commission for the blind.

Blind and deaf children are educated at the expense of the State in an institution for that purpose.

VIRGINIA.

State Institution for the Deaf, Dumb and Blind, Staunton. W. A. Bowles, Supt. Educates poor girls and boys. Supported by the State.

School for Colored Deaf and Blind Children, Newport News. W. C. Ritter, Supt. Supported by the State.

A Committee on the Conservation of Vision was recently appointed by the State Medical Society.

There is no commission for the blind.

Library for the Blind, Staunton, 1,000 volumes.

WASHINGTON.

Mothers' Congress and Parent-Teachers' Association. Mrs. C. E. Brook, Pres. (Tacoma).

State School for the Adult Blind, Seattle.

School for the Blind, Vancouver. Mrs. W. B. Hall, Supt. Supported by the State.

Seattle Association for the Blind, Seattle. M. Callaghan, Sec.

There is a Committee for the Prevention of Blindness.

There is no commission for the blind.

Libraries for the Blind: Seattle, 630 volumes; Spokane, 60 volumes; Vancouver, 750 volumes.

WEST VIRGINIA.

West Virginia School for the Deaf and Blind, Romney. R. C. Montague, Supt. Under State Board of Control. Supported by the State. This school admits people of the ages from eight to twenty-five years.

There is no commission for the blind.

Library for the Blind, Romney, 1,500 volumes.

WISCONSIN.

Association for the Blind, 10th and Prairie Sts., Milwaukee. Dr. E. T. Lobadau, Pres.; Carrie Levy, Sec. This is an independent institution.

State Institution for the Blind. J. T. Hooper, Supt. (Janesville). Supported by the State.

Institution for Blind Artisans, 13th and Fond du Lac Ave., Milwaukee. O. Kusterman, Supt. Supported by the State.

Workshop for the Blind, Milwaukee. O. Kusterman, Supt. Partly supported by the State.

There are day schools for the blind under A. B. Cook, Department of Public Instruction, Madison.

The blind and seeing are educated together in some of the public schools of Milwaukee and Racine. Teachers in charge, Miss C. B. Levy (Milwaukee), Miss C. M. Light (Racine).

A State law was passed in 1907, providing county aid to the needy blind, of \$100 a year, given at the option of the county. It is given to males over 21 years of age and to females over 18 years of age, who are not inmates of any institution and whose income is less than \$250 a year.

There is no commission for the blind.

Libraries for the Blind: Janesville, 6,300 volumes; Milwaukee, 350 volumes.

WYOMING.

There is no commission for the blind.

There are no laws concerning the blind.

The blind youth is educated by the State in schools for the blind in other states.

I will now endeavor to give as faithfully as possible the different State laws concerning blindness and the blind. These laws are given in their entirety, as this is necessary, considering the character of this series of papers. They are papers of reference. Some laws I have been unable to obtain, verbatim, under which circumstances I have been compelled to be satisfied with United States census reports.

ALABAMA.

Article 27.

Alabama Academy for the Blind.

1943 (3712). Educational institution for the blind—established. There is established in this State and located at Talladega, an institu-

tion for the education of the blind, called the Alabama School for the Blind.

(This article based upon act of Feb. 19, 1887, p. 56, and Feb. 7, 1891, p. 458.)

1944 (3713). *Control and Management*—Such institution is under the control and management of the board of trustees of the Alabama School for the Deaf, who may prescribe rules and regulations for the conduct of the same. The principal for the Alabama School for the Deaf is the chief executive officer.

1945 (3714). *Object of School; Application and Admission; Term of Pupilate*—The object of such school shall be to afford means of education to the blind of the State. All blind children of the State between the ages of seven and twenty-one, who are of sound mind, free from disease, and of good moral character may be admitted to the benefits of this school. All applicants must make satisfactory proof to the board of trustees that they are citizens of the State, and that applicant in person, or by next friend, or by affidavit, of any person cognizant of the facts, before a probate judge or notary public. The length of the time which any pupil may continue in school shall not exceed ten years; provided the board of trustees may increase the term of any pupil from year to year, upon the recommendation of the principal, to not exceeding four additional years. And no pupil shall be retained in school after having passed the age of twenty-five. No pupil shall be retained in school after it has been ascertained that such pupil has ceased to make progress or is not being benefited. Any pupil may be dropped at any time for cause by the board of trustees.

1946 (3716). *Appropriations for Each Pupil*—For the maintenance and support of the Alabama School for the Blind the sum of two hundred and thirty dollars per pupil is hereby annually appropriated, such appropriation to be based upon the number of pupils enrolled on the first day of January of each year, and to be drawn quarterly in advance by the treasurer of the board, and disbursed as directed by them.

1947 (3717). *Officers and Teachers*—All officers and teachers of such institution must be appointed, and the salaries fixed and paid in like manner as the teachers and officers of the Alabama School for the Deaf are appointed and their salaries fixed and paid.

1948 (3719). *Laws Relating to the Alabama School for the Deaf Applicable*—All laws now in force or hereafter enacted relating to the admission of pupils and the management and control of the Alabama School for the Deaf, are applicable to the Alabama School for the Blind, except so far as such laws may be inconsistent with the provisions of this article.

ALABAMA.

1915.

(Abstract taken from the last United States Census.)

The Industrial School for White Blind Men was established by a law enacted in 1915. The location of this institution was to be decided by the board of trustees, who were, however, required in deciding the location to have in view facilities for carrying out the object of the school. The board of trustees consists of seven members appointed by the Governor for terms of seven years, of whom two may

be women and not less than two must reside at the place where the school is located, and who serve without any compensation other than actual expenses. The object of the school is to afford a means of industrial education for the adult white blind men of the State. All white blind men of the State over the age of 21 years who are of sound mind, free from disease and of good character may be admitted to the benefits of the school. All applicants must make satisfactory proof to the board of trustees that they are citizens of the State and that they are proper candidates for admission; such proof may be made by the applicant in person or by affidavit or any person cognizant of the facts, before the probate judge or a notary public. The length of time which any pupil may continue in the school must not exceed five years, but no pupil may be retained in the school after it has been ascertained that he has ceased to make progress or is not being benefited. Any pupil may be dropped by the board for cause. The school must teach embossed reading and various trades and, as soon as practicable, furnish work in shops for blind men who have learned trades. For the maintenance of the school \$100 per pupil is appropriated annually, but the sum may not exceed \$10,000 a year. An initial appropriation of \$10,000 was made, to become available February 1, 1917, for the site and erection and furnishing of the necessary buildings for the school.

ARIZONA.

In the House of Representatives, May 25, 1912.

To provide for the care, maintenance and instruction of blind babies and children.

Be it enacted by the Legislature of the State of Arizona:

Section 1. The state board of education shall have power to provide for the suitable care, maintenance and instruction of babies and children under school age residing in this state who may be born blind or become blind in any case where by reason of lack of means or other cause the parent or parents of such children may be unable to properly care for, maintain and educate such children.

2. For the purpose of providing such care, maintenance and education the said board of education shall have power to contract with any institution having or furnishing facilities for such care, maintenance and education in this or any other state at a contract price to be agreed upon, not exceeding one dollar (\$1) per day; provided that such contract shall be made by and with the consent of the parents or the surviving parent of any such child.

3. Such contract shall continue in force and the care, maintenance and education provided therein shall continue until such child attains the age of six years; provided, however, that said board of education may in its discretion continue such contract in force until such child attains the age of twelve years.

4. There shall be included in the tax to be levied for state school purposes a rate sufficient to raise the sum of twenty-five hundred dollars (\$2,500) in addition to all other sums provided by law, which sum or so much thereof as may be necessary is hereby appropriated for the purpose of carrying out the provisions of this act.

5. Nothing in this act contained shall be deemed to repeal or in any way modify any existing law with reference to the education of the deaf, dumb and blind.

ARIZONA.

1913.

(Abstract taken from the last United States Census.)

Education of the Blind.

The State Board of Education must contract with a state having a school for the blind for the education of the blind of the state upon the most economical terms possible, and at a rate not exceeding \$350 a year for each scholar's instruction and board, including board during vacation. Upon receipt of a certificate by the Board of Education to the effect that the applicant is blind, of sound mind, and of parents who are unable to provide for his education, he may receive the benefits thus provided.

Whenever application is made to the board of regents of the State University for the accommodation and education, at the university, of deaf, dumb and blind residents of the State or of persons afflicted with either deafness, dumbness or blindness, it is the duty of the board to make suitable provision for the accommodation and education of the applicants according to the most improved modern systems for such purposes. This requirement, however, is not operative unless at least five residents of the state affected with either deafness, dumbness or blindness make application.

The school census marshal of each school district must include annually in his report the number and names of the blind persons of school age in his district. The report is sent to the county school superintendent, who forwards a copy of it to the State Board of Education for the purpose of ascertaining who may be qualified for the benefits of education for the blind.

ARKANSAS.

Section 4769. The institution of learning heretofore known as the "Arkansas Institute for the Education of the Blind," shall hereafter be entitled "The Arkansas School for the Blind," and all laws and parts of laws in relation to the "Arkansas Institute for the Blind" shall apply to the "Arkansas School for the Blind." Likewise, all contracts made with or by said institute, and all legacies, bequests or gifts made to it shall be binding upon and belong to the "Arkansas School for the Blind."

Section 4770. The management and control of said school shall be under the board of control, appointed, organized and empowered as provided by sections 4667 to 4674.

Section 4667. The management and control of the State School for the Blind, the Deaf Mute Institute, State Hospital for Nervous Diseases and the Confederate Soldiers' Home, shall be under a Board of Control, to consist of three members, who shall be appointed by the Governor, with the approval of the Senate, and shall hold office for a term of six years and until their successors are duly appointed and qualified; provided, that of the board first appointed, one member shall hold for two years, one for four years, and the other for six years. In

case of vacancy occurring upon the board, the Governor shall have authority to fill it by appointing a member to serve for the unexpired term. The members of the board shall reside at the State capital, and shall devote their entire time to the discharge of their duties as such members.

Section 4668. The Governor shall have power to remove any member of the board for inattention, neglect, misconduct or inefficiency in the discharge of the duties of the office; and in case of such removal he shall state definitely and distinctly the ground thereof.

Section 4669. Every person appointed to membership on the Board of Control, shall, before entering upon the discharge of his duties, take the oath prescribed by the Constitution of the State; and in addition shall swear that he will not be interested, directly or indirectly, in any purchase or sale made by the board, or in any contract made with it, that he will not receive, directly or indirectly, any reward or compensation, or any gratuity or thing of value, from any one, whatever, beyond the compensation allowed by law during the term for which he is appointed. Any act in violation of such oath shall render the person offending liable to prosecution for perjury and to removal from the board.

Section 4670. No one shall receive any office or employment under the Board of Control who is of kin, by blood or marriage, within the fourth degree, to any member of it.

Section 4671. The Board of Control shall have full authority to adopt rules and regulations for the conduct of its business, and of the affairs of the institution under its control, as it may deem proper, it may meet at such times and places for the conduct of its business as may seem fit, but must meet at least once each month.

Section 4672. The Board of Control may appoint a Secretary not a member of the Board. He must be a competent and efficient book-keeper, and keep a correct record of all its proceedings, and an account of all its transactions and of all money used in the maintenance of the different institutions. He shall give bond to the State in the sum of ten thousand dollars for the faithful performance of his duties. When directed by the Board, he shall advertise for bids for furnishing supplies to the board for use of the above several institutions, the advertisement to be published in a newspaper published and having general circulation in the city of Little Rock on dates as nearly uniform as is practicable, about the last of each month, calling for bids for supplies to be furnished during the ensuing month (I). Upon receipt of bids, they shall be carefully examined and scrutinized by the board, which shall award the contract to the best bidder, having strict regard to quality and prices; and the board may accept so much of any bid as it finds to be the best, and reject the remainder of it. The board shall provide for a complete and accurate inspection of articles furnished on contracts so let, and reject everything that does not come up to the term of the agreement. The board may at any time remove the Secretary, or the Superintendent, or steward of any of its institutions for inattention, neglect, misconduct or inefficiency in the discharge of his duties, or for adequate cause, but in case of such removal it shall state specifically and distinctly the ground therefor.

Section 4673. At any time that he deems it proper, the Governor may appoint a suitable person to examine into the affairs of any or all the State Charitable Institutions. Such person, while in the discharge of his duties, shall be invested with the power of a notary public to issue subpoenas, administer oaths and take depositions when so instructed by the Governor. Upon completing his examination he shall make a full report to the Governor, and attach to it all testimony taken by him. He shall be paid all expenses actually incurred by him, and the sum of five dollars per day for the time actually employed.

Section 4674. In case of the destruction of any of the Charitable Institutions by tornado or by fire, the Board of Control is hereby authorized, upon the approval of the Governor, to borrow money at a reasonable rate of interest, to immediately replace the damage done to the buildings. The board is hereby authorized to collect insurance in case of property being destroyed by tornado or fire and use the same toward erecting new buildings, under proper restrictions and supplement any money borrowed as herein provided.

Section 4771. All property which has been or may hereafter be acquired by appropriation from the state, or in any other manner, for the use and benefit of the institution, shall be held and deemed to be the property of the state for such use and purposes, and all real estate hereafter purchased shall be deeded to the state, and the deed therefor duly recorded and filed in the office of the Secretary of State.

Section 4772. The board may take and hold in trust for the use of the institution any lands conveyed or devised, and any money or other personal property given or bequeathed, to be applied to the benefit of the institution.

Section 4773. Such board shall make all regulations necessary for the government of the institution not otherwise provided by law, and incorporate the same in the next report they make thereafter to the general assembly. They shall have power to elect a superintendent (16), physician, matron, teachers and steward, to receive an annual compensation to be fixed by the Board of Control, the amount thereof to be reported to the general assembly (16).

Section 4774. The superintendent, steward and teachers of said institution shall not be eligible to the office of member of Board of Control for the same; nor shall any member of the Board of Control be allowed to furnish material for building purposes; nor shall they be, either directly or indirectly, personally interested in the purchase of any article of merchandise or other supplies for the use of such institution.

Section 4775. It shall be unlawful for any person to be employed in any capacity in this institution who is related by consanguinity or affinity within the fourth degree to the superintendent, to any State officer, or any member of a permanent state board, or to any member of a state commission, or to the purchasing agent of any board, and if the treasurer of the state shall knowingly pay any person employed in violation of this act he shall be responsible for the amount on his official bond.

Section 4776. The salary of any person connected with this institution shall not be increased during the period for which he was elected

or employed. When any increase of salary is granted by the board the same shall take effect and be in force at the beginning of the next school term after the said increase is granted.

Section 4777. No teacher shall be employed in the literary department of said institution except teachers who hold first grade county teachers' license, or professional license or state license.

Section 4778. The Board of Control, together with the superintendent, shall elect all teachers, officers and employees and shall discharge the same for failure to faithfully perform their duties and for any conduct unbecoming one holding their positions.

Section 4779. The teachers, officers and employees shall perform such other duties as the superintendent may direct, and when their services are not needed they shall be discharged; provided, if unjustly discharged they shall be entitled to a fair and impartial hearing before the board of control. The board shall have power and authority (in their discretion) to let meat contracts for six months, if by so doing they can obtain a better quality of meat but upon the written complaint of the superintendent, in case of bad meat any contract shall be revoked by the executive committee of the board.

Section 4780. The financial fiscal year for this institution shall end on December 31st of each and every year in so far as the board are concerned.

Section 4781. The Board of Control shall have power and is hereby authorized, in their discretion, to make contracts for the purchase of fuel for twelve months; provided, this period shall not extend beyond the tenure of office of the board.

Section 4782. The secretary of Board of Control shall keep a full and complete record of all contracts made and entered into for all articles bought for the institution and all bids accepted and rejected. Such records shall show all contracts in full, price paid for all items and quantity of each item and from whom purchased. He shall keep a copy and record of all building contracts of whatsoever nature and kind. The board of control and superintendent shall make a full and complete report, to be submitted to the Governor, and each General Assembly, not later than January 15th of each year the General Assembly is in session. The report of the board shall cover the preceding school year. These reports shall deal with improvements made during the biennial period covering the institution for the next legislative period. These reports shall be made and printed together, not later than January 15th of each year the General Assembly is in session.

Section 4783. The Board of Control are invested with the general control and direction of the property and affairs of the institution, with power to direct such purchases as, under the advice of the superintendent, may be deemed necessary for the comfort, health and educational advancement of the blind.

Section 4784. The superintendent may employ such operatives as are necessary for the proper management of the institution, repairs of buildings, cultivation of adjacent grounds belonging thereto, and shall report the same to the trustees at their next meeting thereafter, when, if they refuse to ratify such proceedings, the superintendent shall discharge said employes, and discontinue such repairs and cultivation,

unless otherwise directed by the Board of Control; and no expenditures for building purposes shall be made for the benefit of the institution unless the same shall be recommended by the Board of Control.

Section 4785. The superintendent shall report to the board of control, prior to each session of the General Assembly, a detailed statement of the number of pupils admitted and discharged, their place of residence and supposed cause of blindness, the amount of money expended and for what purpose, and the probable sum necessary to defray the current expenses of the institution until the ensuing session of the General Assembly, which report shall be embodied in that of the Board of Control.

Section 4786. The steward, before entering upon the duties of his office, shall give bond to the state in penalty and with surety, to be approved by the trustees, conditioned for the faithful performance of his official duties, such bond to be filed in the office of the auditor of state.

Section 4787. The steward shall discharge his various duties under the direction of the superintendent, who shall examine all statements prepared by the steward, whether for past or contemplated expenditures, and the Board of Control shall receive no statement of the same from the steward, unless the approval of the superintendent is endorsed thereon.

Section 4788. The Board of Control shall keep a book, in which they shall record all allowances, and make an entry of the proceedings had thereon, and the steward shall report to such Board of Control a detailed statement, under oath, of all the expenditures he may have made for the preceding three months, to whom made, and for what purpose, and such report shall be accompanied with proper vouchers.

Section 4789. Board of Control and superintendent are authorized to present to each pupil who shall have finished the course in the institution, and who shall be honorably discharged from the same, having learned to read by touch, a copy of the sacred scriptures and a copy of the Constitution of the United States in raised print.

Section 4790. The superintendent shall give bond to the state, in penalty and with surety, to be approved by the Board of Control, for the faithful performance of his official duties, which bond shall be filed in the office of the auditor of state; and if, from any cause, the penalty or surety of such bond become insufficient, the Board of Control shall require such superintendent to execute an additional bond, or give other sufficient security, and in default thereof such superintendent shall be removed from office by the board of trustees.

Section 4791. The Board of Control shall keep a full and correct account of their proceedings in books to be provided for such purpose.

Section 4792. The officers of the institute shall make report to the board as it may from time to time require.

Section 4793. The Board of Control and superintendent shall each make detailed reports biennially to the General Assembly of their proceedings, the condition of the institute, the number of pupils and other facts connected with the institution, including the exact receipts and expenditures of the board.

Section 4794. All blind persons of suitable character and capacity

between the ages of six and twenty-six years, residing in the state, shall be entitled to the benefits of the institution free of charge. Pupils from without the state may be admitted to the privileges of the institution on payment of such sum as the board may consider sufficient to defray expenses.

Section 4795. If, in the opinion of the Board of Control, any blind person above the age of twenty-six may be benefitted by being received into the institution for a limited time, to learn a trade, or receive other instruction, they may, by unanimous vote, and approval of the superintendent, admit such person, and they may expel from the institution any pupil whose longer continuance in the same would be injurious thereto.

Section 4796. There shall be, of each biennial report of the Board of Control to the General Assembly fifteen hundred copies printed—one thousand for the use of the General Assembly, and five hundred for the institution.

Indigent Pupils.

Section 4797. Whenever application is made for the admission of any blind person into the said school (17) as a beneficiary of the privileges thereof, such application shall be accompanied by certificate of the county judge that such person is a legal resident of the county in which it is claimed that he or she resides.

Section 4798. When such person shall, upon proper application, be admitted as pupils of said school, it shall be the duty of their parents, guardians or other friends to suitably provide them with clothing at the time of their entrance into the school and during their continuance therein; also to defray their traveling expenses to and from the institution, not only at the time of the first entrance and final departure, but at any other time when it shall become necessary for them to leave or return to school.

Section 4799. In all cases when suitable clothing and means for defraying traveling expenses are not otherwise supplied to the pupils of said institution, the same shall be provided by the superintendent or principal thereof, who shall make out and file with the auditor of state, accounts therefor, separate in each case, against the respective counties from which such pupils are sent, in an amount not exceeding forty dollars per annum for any one pupil, which accounts shall be severally signed by the superintendent or principal; and the auditor of state shall draw his warrant on the treasurer for the said amounts, which shall be paid out of any money in the treasury not otherwise appropriated. Provided, the amount drawn by said institution for said purposes, in one year, shall not exceed two thousand dollars; and each account thus certified shall be charged to the county from which the pupil named therein was sent.

Section 4800. The auditor of state shall forward a certified copy of each account so filed with him to the sheriff of the proper county, who shall proceed to collect the same in the name of the state as other debts are collected, and the money so collected shall be paid over to the treasurer of state, who shall give receipts therefor, as in cases of other moneys paid into the state treasury; provided, if the sheriff shall be unable to collect the amount of any bill from the parents or estate

of any pupil, then the same shall be refunded to the state out of the county treasury.

Section 4801. The funds arising from the sale of articles made at the school by student labor shall be used as a contingent fund by the superintendent, under the direction of the Board of Control, for the purpose of paying for postage, freight, expressage, telegraph and telephone calls, emergency medicines and such other purposes as the Board of Control may direct, and the superintendent shall submit an itemized statement of receipts and expenditures from this fund to the board at its monthly meetings.

Section 4802. In case of the death of any pupil at said school, where funeral expenses are not otherwise provided for, an account thereof shall be made out, certified to and collected, and applied in like manner as provided in the preceding sections of this act.

Section 4803. Whenever it shall be deemed necessary by the proper officers of said institution, in accordance with the bylaws and regulations thereof, to have pupils removed, either temporarily, on account of ill health, or the vacation of the school, or permanently, on account of having completed their course of instruction, or been found disqualified, from any cause, for a longer continuance in the school, the parents or guardians of such pupils, if they have any, shall promptly remove them upon requirement of said officers; and, in case they shall not thus be provided for, it shall be the duty of the superintendent or principal of such institution to cause them to be so removed to their houses or delivered to the proper officers of the counties in which they may reside, and the expense of such removal shall be refunded to said institution in the same manner as provided in sections 4799 and 4860, and the county sheriff may collect it in the same manner as provided in sections 4799 and 4800.

Buildings, Use of Forbidden, Except for Certain Purposes.

Section 4804. No person, teacher, party, servant or employe shall be boarded, lodged or in any manner whatever provided for during the vacation of said school, neither shall any party or person at any time be lodged, boarded or permitted to remain at said school at the expense of the state not herein specifically designated and provided for: Provided, this section shall not apply to those employees and pupils who have no homes, required to remain at said school during vacation as herein provided for.

Collections of Warrants for Indigent Students (18).

Section 4805. It shall be the duty of the sheriffs of this state to receive from the county clerks all warrants ordered by their respective county courts by virtue of section 4800 and present them to the county treasurer for payment.

Section 4806. The county treasurer of the proper county shall pay said warrants on presentation from any money on hand and appropriated for pauper purposes; but should there be no money in his hands from which to pay off said warrants, he shall indorse the fact on the warrants, date and sign the said endorsement and return them to the sheriff.

Section 4807. The treasurer of the state is authorized to receive

from the several sheriffs and collectors of the state any and all such warrants as may hereafter be ordered and issued in payment for clothing and expenses; provided, said warrants shall be drawn in favor of the state, shall state on their face the name of the pupil or inmate whose expenses are thereby refunded, and shall be indorsed as required by section 4806.

Section 4808. The state treasurer is authorized to apply such county warrants so received in payment of auditors' warrants drawn in favor of the counties for funds received from sales or redemption of lands in lieu of any currency in his hands from said source belonging to the respective counties whose warrants he holds, replacing the county warrants with the currency.

Section 4809. The state debt board may in October, 1894, and biennially thereafter, make such disposition of the county warrants so received and not converted into par funds, as provided in section 4808, as shall in the judgment of the board be for the best interest of the state and shall order the proper adjustment of the account of said county warrants on the books of the state treasurer and auditor.

Section 8492. It shall be lawful for any indigent or disabled ex-Confederate or ex-United States soldier or sailor and all blind persons having certificate of attendance at blind school, residing in this state, to engage in what is commonly known as hawking and peddling, to give illustrated lectures and magic lantern exhibitions and such other like entertainments, and further, he shall be permitted to engage in brokerage or real estate, or any other business that is not prohibited in this state, without either paying state, county, city or town license or tax for the privilege of so doing; provided, that the provisions of this act shall not apply to any ex-Confederate or ex-United States soldier or sailor drawing a pension exceeding eight dollars per month, etc.

CALIFORNIA.

Senate Bill No. 472—Chapter 681.

An Act to Provide Readers for Blind Students in the University of California and to Assist Deaf Students Attending the National College for the Deaf at Washington, D. C., and Making an Appropriation Therefor.

(Approved June 9, 1915.)

The People of the State of California do enact as follows:

Section 1. The sum of three thousand dollars, or so much thereof as may be necessary, is hereby appropriated out of any moneys in the state treasury not otherwise appropriated, to be expended under the supervision of the board of directors of the California School for the Deaf and the Blind, during the biennial period ending June 30, 1917, in providing readers for blind persons who shall be residents of the state of California and graduates of the California School for the Deaf and the Blind, and who shall regularly matriculate in, and work for a degree in the University of California; and in defraying the expenses of deaf persons who shall be citizens of the state of California, and graduates of the California School for the Deaf and the Blind, taking a collegiate course of instruction in the National College for the Deaf at Washington, D. C.: Provided, however, *that not more than three hun-*

dred dollars shall be expended for any one student during any one school year.

CALIFORNIA.

1915.

An Act Establishing an Industrial Home of Mechanical Trades for the Adult Blind of the State of California, Creating a Board of Directors for the Government Thereof, and Appropriating the Sum of Sixty-five Thousand Dollars for the Support of said Home.

(Approved March 17, 1887; Stats. 1887, p. 160.)

The people of the State of California, represented in Senate and Assembly, do enact as follows:

Article I.

Section 1. The sum of sixty-five thousand dollars is hereby appropriated out of any moneys in the state treasury not otherwise appropriated, to be placed by the State Controller to the credit of the fund hereafter to be known and designated as "The Fund of the Industrial Home of the Adult Blind," and to be expended for the objects and in the manner hereinafter specified.

Sec. 2. The said appropriation is for the purpose of teaching and supporting the adult blind that may be admitted to the Home, and for providing the material for the workshops, the cost of additional machinery for the same, the payment of all persons employed at the Home, and for all legitimate expense of maintaining the institution hereinbefore named.

Sec. 3. All moneys drawn from this fund shall be drawn only when bills have been ordered paid by the Board of Directors of the Home and approved in writing by the State Board of Examiners; and when so approved the State Controller must issue his warrant in payment thereof, and the State Treasurer must pay the same.

Sec. 4. The Governor of the state shall appoint five citizens of the state, who shall organize as and constitute the Board of Directors for the Home for Adult Blind.

Sec. 5. The Home shall be located at such a place as the Board of Directors may designate.

Article II.

Section 1. The objects of the Industrial Home are: First, to instruct the adult blind that may be admitted as inmates in some trade or trades, in order to enable them to contribute to their own support; and, second, to furnish a working home for the adult blind, who, after having learned a trade or trades, desire to remain at the home as workmen; provided, that all of the latter class who remain shall pay to the state, through the Board of Directors, the cost of their maintenance at the home. The rate of wages to be paid to these journeymen, as well as the amount which they must pay for their maintenance, shall be fixed by the board.

Sec. 2. Every blind person who has been a resident of this state for a period of three years prior to his application for admission, of suitable age, character and qualifications (as hereinafter provided), shall be entitled to the benefits of instruction in said home, free of charge; provided that the Board of Directors may admit blind persons from other states; but the admission of such blind persons shall be made

under such conditions only as shall not entail cost on this state; and provided, further, that the admission of persons not residents of this state shall in no case be allowed, if such admission would exclude a qualified blind resident of this state.

Sec. 3. The salaries of the superintendent, secretary and physician, and all other expense accounts, including the wages of workmen at trades, and employees, must be paid monthly out of the moneys appropriated by the Legislature for the support of the home, or from accumulations from the industries of the home, or from the donations and bequests to the home, made without restraining conditions, whenever resort to said donations or bequests be necessary. All such claims in said expense account, excepting salaries of said officers, shall be first approved by the board of directors, and shall be so indorsed by the secretary and attested by the president, and shall immediately thereafter be sent forward to the secretary of the State Board of Examiners. When the claims have been approved by the said Board of Examiners, the Controller must issue his warrant therefor, directed to the State Treasurer, in favor of the Board of Directors. The State Treasurer is authorized to pay such warrant only when indorsed by the secretary and attested by the president of the board. No claim for wages of employees or workmen at trades shall be audited by the Board of Directors until having first received from the foreman his monthly time certificate, duly verified by his oath, and stating the amount of labor performed by the employee or workman. (As amended, Stats. 1889, p. 147.)

Sec. 4. The official bonds hereinafter required must be approved by the Board of Directors, and filed and recorded in the office of the Secretary of State. The approval of the bond must be by indorsement thereon by the president, and reference thereon made by the secretary to said action of the board.

Article III.

Section 1. The powers and duties of the Board of Directors shall be as follows:

First—To make bylaws, not inconsistent with the provisions of this act and the laws of the state, for their own government and direction of the home, and to admit suitable persons as inmates thereof. And in the admission of inmates the Board of Directors shall have regard to an equitable representation from each county in the state.

Second—To designate the trades that shall be regularly taught in the said institution.

Sec. 2. First—To elect a general superintendent and all subordinate officers and employees, and to determine the number of subordinate officers and employees when not otherwise fixed in this act.

Second—To elect a physician, who shall not be a member of the Board of Directors, and whose salary shall not exceed twelve hundred dollars per annum. (As amended, Stats. 1889, p. 147.)

Third—To elect a secretary, whose salary shall not exceed six hundred dollars per annum, and who shall be required to give a bond in the sum of five thousand dollars.

Sec. 3. To prescribe in particular the duties of the superintendent, physician and secretary.

Sec. 3. To make inquiry into the department of labor and expense, the condition of the home and its prosperity, and to employ all reasonable means to make the same self-supporting.

Sec. 5. To hold stated meetings at the home at least once in every month.

Sec. 6. To keep at the home a record of their proceedings, which shall be accessible to the public during the hours from 9 a. m. to 4 p. m., excepting on legal holidays.

Sec. 7. To report annually in the month of December to the Governor, a statement of receipts and expenditures, the condition of the home, the number of inmates and the number of beneficiaries doing work at their own residences, and such other matters touching the management of the home as they may deem proper. The annual report must be verified by the oath of the president of the Board of Directors. The Superintendent of State Printing is hereby authorized to print annually two thousand copies of said report, which copies the board must circulate in the manner appearing to them to be in the best interests of the home.

Sec. 8. The Board of Directors is empowered to purchase, from time to time, such material as may be suitable to the requirements of the manufacturing and other departments of the home, and to audit the bills therefor, and to forward the same to the State Board of Examiners. When approved by said state board, the Controller must issue his warrants in payment therefor. All purchases shall be made as provided in section twenty of this article.

Sec. 9. The Board of Directors is empowered and authorized to fix the market price of all wares manufactured in the home, and all ware manufactured elsewhere by the non-resident beneficiaries, and to provide for and regulate the sale of all such manufactured wares. The board is hereby authorized to fix the compensation of common laborers and all other employees at the Home, whose wages are not herein established.

Sec. 10. It shall not be a condition for the admission of any applicant that he be of such physical strength as to be able to work every day. And the board is authorized to receive and maintain at the home, free of charge, or at a nominal charge, such aged and enfeebled blind persons as seem to them proper, and not in conflict with the interest of the home.

Sec. 11. The Board of Directors is authorized and empowered to grade and fix the prices of skilled and unskilled labor. The board may fix the amount of work required in the various departments to constitute a day's labor, and in accordance with such regulations may permit inmates to work at piece-work.

Sec. 12. The Board of Directors may authorize work to be let out to blind people, so that such beneficiaries as in their judgment may require it, shall receive it at their residence; and for such piece-work liberal prices shall be paid, so as to equal, as nearly as possible, the compensation of resident laborers. But in no case shall the board incur any indebtedness for labor contracts with beneficiaries, resident or otherwise, except when there is sufficient money on hand to pay the same.

Sec. 13.—The board shall provide dormitories for males and females in separate apartments, and may prescribe conditions, not inconsistent with the provisions of this act for the admission of applicants.

Sec. 14. The directors shall receive no compensation for their services.

Sec. 15. The Board of Directors of the Industrial Home of Mechanical Trades for the Adult Blind of the State of California is hereby authorized and empowered to take, receive, manage and invest all moneys or property hereafter bequeathed or donated to said home, in accordance with the wishes of the testator or donor; or, if no conditions are attached to the bequests or donations, then to invest such moneys or proceeds of property for the best interests of the home; provided, that if any donation or bequest be trammelled with any religious conditions of a sectarian character, or conditioned in any manner antagonistic to the provisions of this act, or in conflict with any necessary rule or regulation of the home, the Board may refuse to accept such donation or bequest, and is hereby authorized to reject the same. Donations or bequests may be received by the State Treasurer, or by the president of the Board of Directors; but no donations or bequests accompanied by any condition shall be received until such donation or bequest shall have been ordered approved and received by the board, and notice thereof given by the secretary to the State Controller. Any bequest or donation received or collected by the president of the board must be immediately paid over by him to the State Treasurer, and at the same time the president must forward to the State Controller a statement thereabout, verified by his oath. All moneys received by the State Treasurer must be placed to the credit of the "Fund of the Industrial Home of Adult Blind." The investment of funds by the board can be made only in the same manner as the approval of claims, subject likewise to the action of the State Board of Examiners thereon.

Sec. 16. It shall be the duty of the president of the board to make careful and diligent inquiry into the general management of the home, and to report the result thereof at each meeting of the board, together with such recommendations as he may wish to make concerning the management of the home.

Sec. 17. Every officer and employee of the home, and any other person acquiring possession, by any means whatever, of moneys belonging to the home, must, at the close of each and every month, deliver the same to the Board of Directors, accompanied by a statement thereabout, verified by his oath, taking the secretary's receipt therefor. The Board of Directors must, at least once in every month, forward to the State Treasurer all moneys in their charge belonging to the home. The secretary of the board must, at the same time, forward to the State Controller a statement thereabout, verified by his oath. All such moneys received by the State Treasurer must be placed to the credit of the "Fund of the Industrial Home of Adult Blind."

Sec. 18. Immediately upon the election or dismissal of any officer, whose salary is fixed by the provisions of this act, the board must cause the secretary to forward to the Controller of State a certified copy of the resolution of said election or dismissal, which the Controller must file in his office.

Sec. 19. The president of the board shall appoint all committees unless otherwise ordered by the board, and he shall be ex-officio a member of each of the standing committees.

Sec. 20. The Board of Directors are authorized and required to contract for provisions, fuel and all other supplies needed for any period of time not exceeding one year; and such contracts shall be limited to bona fide dealers in the several classes of articles contracted for. Such contract shall be given to the lowest responsible bidder, at a public letting thereof, if the price bid is fair and not greater than usual market prices. Each bid shall be accompanied by such security as the board shall require. Notice of the time, place and letting of each contract shall be given for at least two consecutive weeks in a daily paper published in the city of San Francisco, and in one newspaper published in the city or town where the home is located. If all the bids at any letting are deemed by the board unreasonably high, the board may decline to contract, and may again advertise until satisfactory contracts are made; and in the meantime the board may contract with any person whose contract is just and equitable, but no contract thus made shall extend beyond sixty days. No bid shall be accepted when such bid is higher than any other bid, made at the same letting, for the same class or schedule of articles. When two or more bids are equal in amount the board may divide the contract between the bidders.

Sec. 21. The board shall designate the number of employees, prescribe their duties and fix their compensation. All employees shall be appointed by the superintendent, subject to the approval of the board.

Article IV.

The superintendent shall be the chief executive officer of the home, with duties and powers as follows:

First—To superintend the grounds, buildings, workshops, manufacturing departments and property of the home.

Second—To certify to the Board of Directors the number of instructors and employees needed in the manufacturing departments, and to recommend to the board the appointment of suitable persons for these positions.

Third—To dismiss any domestic, servant or person employed at the home—other than an instructor or an employee in the manufacturing department—whenever in his judgment the good of the home demands it.

Fourth—To prescribe and enforce the duties of all instructors, employees, domestics, servants and laborers employed at the home.

Fifth—To admit inmates only upon the certificate of the attending physician, or by order of the board, as hereinafter provided; to control the inmates, and to prescribe and enforce a system of instruction and labor.

Sixth—To suspend any instructor or employee pending a recommendation to the board for his permanent dismissal, and to appoint substitutes during the absence of any or all employees.

Seventh—Pending a recommendation to the board for his final dismissal, to suspend the privileges of and to remove from the premises any inmate whose presence appears to be in conflict with the interests of the home. Should any inmate so suspended or removed be in desti-

tute condition, the superintendent must, upon his demand, furnish him with suitable lodgings and board elsewhere, until the decision of the board is made thereabout. The bill therefor must be presented to the board for payment in the same manner as other claims.

Eighth—To reside at the home.

Ninth—To keep a daily record of his official acts in the manner prescribed by the board, and to present the same to the board at each monthly meeting, verified by his oath, in accordance with the blanks furnished by the board for that purpose, and to make in said monthly reports such recommendations to the board as he may deem proper. The monthly report must contain a statement of all stock, goods and supplies of any nature received at the home during the month.

Tenth—To turn over to the board at the close of each and every month, together with the balance sheet, all moneys derived by him from the sale of manufactured goods, and all revenues derived by him from any source whatsoever in behalf of and for the benefit of the home, and to take the secretary's receipt therefor.

Eleventh—To make up and present to the board, in the month of July of each year, his annual accounts and statement of the affairs of the home, verified by his oath. The annual statement shall be an epitome of the monthly reports, and shall contain the number and names of all inmates, officers and employees and their respective dates of admission, or beginning of employment, and the respective dates of dismissals made during the year. It shall contain a full review of all receipts and expenditures, and an invoice of all goods and stocks and supplies on hand. It shall contain, also, the average weekly cost of board per capita of all persons residing at the home, without considering the labor credits, and the average annual cost of instruction per capita. It shall show clearly the relation of the gross products to the gross cost, and the percentage lacking in order to become self-supporting. For the making up of said statement the superintendent shall have full access to the secretary's and other books of the home, and said statement shall be independent of each and all of the other annual reports.

Twelfth—To make requisitions on the Board of Directors for articles and goods needed at the home, and to order the same as directed by the board; provided, that the board may, by resolution spread upon its minutes, authorize the superintendent, in case of emergency, to make purchase of material and supplies for the home without such previous requisition.

He must, in addition, perform such further services as may be required of him by the board. The annual salary of the superintendent shall be twenty-one hundred dollars. He must execute an official bond in the sum of five thousand dollars. The superintendent must be a man of good education, of good moral character, and business experience.

Article V.

It shall be the duty of the physician to examine at his office, at a stated hour daily, and at the home at a stated hour upon the days of his visits, all applicants for admission as to their blindness. If the applicant appears to be a proper subject for admission to the benefits of the home, the physician must forthwith deliver to him his certificate

of admission, directed to the board and to the superintendent of the home. Upon presentation of the certificate the superintendent must admit the applicant as a beneficiary. Any applicant rejected by the attending physician shall have the right of appeal to the board. The physician must present to the board monthly a statement of the sanitary condition of the home, and must therein specify the days and dates of his visits, and the ages and nativity of each person to whom he has issued during the month a certificate of admission, together with the cause or causes of their blindness, their physical condition, and also as to whether any such inmates would be benefited by medical treatment, as well as other matters which the board may deem proper to require of him. The monthly statements must be made upon blanks furnished by the board for that purpose. He must present to the board, in the month of July, his annual report, which shall be an epitome of his monthly reports, and in which he must specify, with particularity, all sickness at the home during the year; and such observations and recommendations may be therein made as seem to him pertinent to the sanitary welfare of the home. The attending physician must, in no instance, permanently treat any inmate for blindness, or any optical affection, without permission in each case first being given by the board, at the request of the person so afflicted. The attending physician must visit the home once every day.

Article VI.

This act shall take effect from and after its passage.

AN ACT

Appropriating Money for the Erection of Buildings at the Industrial Home of Mechanical Trades for the Adult Blind.

(Stats. 1889, p. 89.)

The people of the State of California, represented in Senate and Assembly, do enact as follows

Section 1. The sum of fifteen thousand five hundred dollars is hereby appropriated out of any money in the state treasury not otherwise appropriated, for the erection of buildings at the Industrial Home of Mechanical Trades for the Adult Blind. Not exceeding the sum of ten thousand five hundred dollars of said sum appropriated shall be expended for the purpose of erecting dormitories at said home; not exceeding the sum of two thousand five hundred dollars shall be expended for the purpose of erecting a residence for the superintendent of the said home; and not exceeding the sum of two thousand five hundred dollars shall be expended for the purpose of enlarging the dining room and making additions to the shops now upon the grounds of said home.

Sec. 2. All said moneys shall be expended in accordance with law, under the direction of the trustees of said home.

Sec. 3. The Controller of State is hereby directed to draw his warrant in favor of the trustees of said home for the amount herein appropriated, and the Treasurer is directed to pay the same.

Sec. 4. This act shall take effect from and after its passage.

AN ACT

To appropriate the Money Now in the Treasury of the State of California, Known as the "Adult Blind Fund, Unavailable."

(Stats. 1889, p. 152.)

The people of the State of California, represented in Senate and Assembly, do enact as follows:

Section 1. The money now in the treasury of the state of California, being the proceeds of the industries of the Industrial Home of Mechanical Trades for the Adult Blind, and now amounting to the sum of seventeen thousand nine hundred and fifty-five and fifteen one-hundredths dollars, together with the accumulations for the months of January and February, eighteen hundred and eighty-nine, is hereby appropriated as follows:

The sum of two hundred and five and twenty one-hundredths dollars is hereby appropriated to pay the balance due for the construction of the dormitories at said home.

Sec. 2. The sum of five hundred and thirty-four and five one-hundredths dollars, with interest on said sum at the rate of seven and one-half per cent per annum from May 1st, 1888, to date of passage of this act, is hereby appropriated for the purpose of releasing the mortgage on the property conveyed by Peter Thomson to the Industrial Home of Mechanical Trades for the Adult Blind; together with the sum of one hundred dollars to pay said Peter Thomson for the use and occupation of said property by the home prior to the date of its conveyance.

Sec. 3. All the remainder of said sum of money is hereby directed to be turned into the Fund of the Industrial Home of Mechanical Trades for the Adult Blind, to be used as other moneys belonging to said fund, in accordance with law, under the direction of the Board of Directors, for subsistence, purchase of raw materials and for improving the grounds of said home.

Sec. 4. This act shall take effect from and after its passage.

CALIFORNIA.

(Abstract taken from the last United States Census.)

School for the Blind.

The management and control of the California School for the Deaf and Blind is vested in a Board of Directors, consisting of five persons appointed by the Governor, with the consent of the Senate, for the term of four years, who receive no compensation. The board must meet at least once in three months at the school, and must report to the Governor. (Laws 1915.)

The school is a part of the school system of the state, except that it does not derive any revenue from the public school fund, and has for its object the education of the deaf and blind who by reason of their infirmity cannot be taught in the public schools. (Laws 1913.)

Every blind resident of the state of suitable age and capacity is entitled to an education in the school free of charge. If the parent or guardian of any pupil in the school is unable to clothe such child or pay for its transportation to and from the school, he may testify to such inability before the judge of the superior court of his county of residence, and if the judge is satisfied of the truth of such fact, he must issue a certificate to that effect, and upon presentation of the certificate the directors of the school must clothe the pupil and provide the transportation at the expense of the county from which the pupil comes. All pupils in the school are maintained at the expense of the

state. Blind persons from other states may be admitted to the school upon paying the treasurer \$85 quarterly in advance. (Laws 1915.)

Compulsory Education.

Every parent or guardian of any blind child who is legally entitled to admission in the state school for the blind must send the child to the school for five years, or until the child has reached the age of majority, unless the child is excused from attendance by the board of education or board of trustees of the city, city and county, or school district in which the child resides, for the reason that the child's bodily or mental condition is such as to prevent or render inadvisable attendance at the school or that he is receiving proper instruction at home or at some public or private school. Failure to comply with this requirement constitutes a misdemeanor. (Laws 1903.)

COLORADO.

An Act to Establish a Workshop for the Employment of Blind Men and Women, and Making an Appropriation Therefor.

Be it enacted by the General Assembly of the State of California:

Section 1. That there is hereby established at Denver an "Industrial Workshop for the Blind."

Sec. 2. General supervision and control of the workshop shall be vested in a Board of Control, consisting of three members, to be appointed by the Governor, by and with the advice and consent of the Senate, and the term of the members of said board shall be for a period of two years from the date of their appointment, or until their successors shall be appointed and shall qualify. And whenever a vacancy shall occur on the board through the death or resignation of any member of said board, the Governor may appoint a successor to fill the unexpired term.

Section 3. The board shall select suitable quarters by lease, purchase or otherwise in the City of Denver, and shall have full power to establish, maintain, direct and supervise all matters pertaining to the workshop, its maintenance and regulation, and to purchase all necessary machinery and materials; to teach all trades suitable to blind people. The meetings of the board shall be held at such times and places as they deem proper, but no contracts made by or for the board for the institution shall exceed the appropriation therefor as specified in this act.

Sec. 4. For the purposes of providing for the establishment of a suitable shop and for its maintenance there is hereby appropriated out of the general fund the sum of ten thousand dollars to be used in leasing or purchasing or securing a building or place for the workshop and for the payment of all necessary expense incurred in carrying out the purpose of this act.

Sec. 5. The members of the Board of Control shall constitute a body corporate under the name and style of "The Board of Control of the Colorado Industrial Workshop for the Blind," with the right to acquire and hold property, real, personal and mixed; to sue and be sued; and of making and using a common seal, and of altering the same at pleasure. The board shall organize immediately upon its appointment and elect one of its members as chairman, and one as treasurer.

Sec. 6. A majority of the board shall constitute a quorum for the transaction of business. The board shall be empowered to hire a secretary to keep all books and accounts, and other necessary employees, at a compensation to be fixed by the board.

Sec. 7. The workshop shall be open for the labor of all blind men and women, who shall have been citizens of the state of Colorado, for at least three years and over the age of twenty-one years, who can give satisfactory references as to character.

Sec. 8. No labor shall be for over eight hours continuous duration during any twenty-four hours.

Sec. 9. All the products made in the shop or by the use of its machinery or materials in or out of the shop, shall be the property of the shop and of the state, to be sold and disposed of by said board. And the amounts realized from the sale of the products made at the shop or with its tools and materials, shall be paid to the treasurer, to be applied to the further expense and maintenance of the shop; all surplus funds derived from the amounts received from the shop after the payment of expenses, shall be applied to the enlargement and improvement of the shop.

Sec. 10. The treasurer shall before entering upon his duties give a bond in the penal sum of ten thousand dollars, in some responsible surety company, to be approved by the board, for the faithful discharge of his duties, and to account for all moneys under the direction of the board.

Sec. 11. All vouchers for the purchase of supplies or other indebtedness of the shop shall be signed by the secretary and chairman of the board, and shall be passed upon by the board before any moneys are disbursed.

Sec. 12. In the opinion of the General Assembly an emergency exists; therefore, this act shall take effect and be in force from and after its passage.

Approved April 8th, 1907.

COLORADO.

1911.

An Act Concerning the Education and Teaching of the Adult Blind of Colorado; Creating and Establishing the Office of a "State Teacher of the Adult Blind in the State of California," Prescribing the Duties of said Office and Providing for the Qualifications, Appointment, Term of Service, Salary and Traveling Expenses of Said Officer.

Be it enacted by the General Assembly of the State of Colorado:

Section 1. That the office of State Teacher for the Adult Blind of the State of Colorado is hereby created and established. Said officer shall be either male or female resident of this state, to be selected and appointed by the State Board of Education at its annual meeting, the last Saturday in December each year, and shall hold office for one year from said date or until his successor is duly appointed, except, that within fifteen days after the taking effect of this act said State Board of Education shall duly appoint such officer to hold office until the last Saturday in December, 1911: Provided, That said board in selecting said officer shall make such appointment by the virtue only of the

appointee's peculiar fitness for the position, good moral character, and shall where practicable select non-seeing person as such teacher.

Sec. 2. The duties of said officer shall embrace the education and teaching of all adult blind residents of Colorado at their respective homes, under such regulations, directions and procedure, and in those methods and educational branches as the State Board of Education shall prescribe. It shall be the duty of said officer to prepare, maintain and keep a "Register of the Adult Blind of Colorado," which register shall describe their condition, cause of blindness, capacity for education and industrial training, and other material and relevant facts concerning said persons; and the "Board of Control of the Colorado Industrial Workshops for the Blind" and the superintendent of the "Colorado School for the Deaf and Blind" are hereby directed to cooperate with said officer in the preparation and maintenance of said register by furnishing from time to time the names, addresses and such other facts concerning the adult blind in Colorado as may appear on their records or otherwise come to their knowledge. The work of preparing and maintaining said register shall be done in the office of and by the advice and under the direction of the State Superintendent of Public Instruction, where said register shall be preserved and filed, and whose office shall be the general headquarters for the said state teacher of the adult blind.

Sec. 3. All the time and services of said officer shall be devoted ratably among the homes of all said adult blind, in the manner and way the State Board of Education shall prescribe, and he shall, prior to the first of November of each year, prepare and file with the president of said board a full and complete report of all of the work commenced or accomplished by his office during the preceding year: Provided, That the State Board of Education shall have the power at any time to remove said officer, after due hearing, for any reason sufficient to said board, and to appoint another officer for such unexpired term.

Sec. 4. The State Teacher of the Adult Blind of Colorado shall receive a salary of one thousand dollars (\$1,000) a year, payable in equal monthly installments by the State Treasurer from the same fund provided for the payment of other state officers, and upon due warrants of the State Auditor, who is hereby authorized and directed to issue the same upon receipt of properly issued vouchers of the State Board of Education. Said officer shall also be paid and allowed all traveling and living expenses while away from the place of his residence and traveling within the limits of the state in fulfilment of the duties of his office, and also all books and papers necessary for the preparation of said register, and also all necessary teaching equipments and teaching methods, duly approved by the State Board of Education, not to exceed in all the sum of five hundred dollars (\$500) for any year, which said expenses shall be evidenced by itemized statements thereof, filed by said officer with the State Board of Education at the end of each month, and shall be paid monthly by the State Treasurer in the same manner as the expenses of the other state officers allowed by the law are paid, and upon due warrants of the State Auditor, which officer is hereby directed and authorized to issue said warrants upon receipt of

properly issued vouchers of the State Board of Education covering said expenses.

Sec. 5. In the opinion of the General Assembly, an emergency exists, therefore this act shall take effect and be in force from and after its passage.

Approved June 1st, 1911.

COLORADO.

1912.

(Abstract taken from the last United States Census.)

The management of the Colorado School for the Deaf and Blind is vested in a board of five trustees appointed by the Governor with the consent of the Senate for terms of six years. The trustees receive no compensation other than their actual expenses incurred in the performance of their duties. The object of the school is the education of such children of the state as cannot, by reason of the impairment of their sense of hearing or of sight, be advantageously educated in other schools of the state. Every blind citizen of the state of sound mind, over 6 and under 21 years of age, is entitled to receive an education in the institute at the expense of the state. All applicants above the age of 21 years may be admitted at the option of the board. Each county superintendent of common schools must report annually to the superintendent of the institute for the deaf and blind, the name, age and address of every blind person of suitable age for admission to the school residing in his county, including all such persons as may be too blind to acquire an education in the common school. At the time of taking the annual census, the district secretary must use reasonable diligence to ascertain the number of blind persons, resident in the district, between the ages of 4 and 22 years, with the name and address of each, which items are to be included in his annual report to the county superintendent. When there is room in the institution residents of other states may be admitted upon the payment of a sum to be fixed by the trustees but not to be less than the per capita cost of the inmates for the preceding year. In every case where a blind person sent to the institute is too poor to furnish himself with sufficient clothing and pay the expense of transportation to and from the institution, the county of his residence must meet the expense if the judge of the county court thinks him a proper subject for the care of the institute.

CONNECTICUT.

1903.

An Act Concerning Aid for Adult Blind Persons.

Be it enacted by the Senate and House of Representatives in the General Assembly convened:

Section 1. The provisions of section 2295 of the general statutes are hereby extended so as to include every blind person who has been a beneficiary of the state in any institution for the blind for the purpose of learning a trade which shall be conducive to his or her self-support, provided such adult blind person is a legal resident of this state.

Sec. 2. Every adult blind person desiring to receive the aid provided for in section 2295 shall make written application therefor to the state authorities having in charge the industrial education of the blind, which application shall be accompanied by a statement signed by not

less than twelve reputable citizens of the town to which said blind person belongs, to the effect that said blind person is industrious, of good habits and capable of carrying on in a competent manner a trade which he or she has learned.

Sec. 3. Upon the approval of said application by said state authorities, they may provide, under such conditions as they may deem necessary, machinery, tools and materials to the amount of not more than two hundred dollars in any one case, for the purpose of enabling said person to carry on such trade, and the appropriation made biennially by the General Assembly for the care and education of the blind shall be made to include the sum deemed necessary by the proper state authorities to accomplish the provisions of this act during the succeeding biennial period.

Sec. 4. Every article so provided for such blind person and the income from labor thereby shall be exempt from attachment.

Sec. 5. This act shall take effect from its passage.

Approved May 29, 1903. (Chapter 62.)

CONNECTICUT.

1905.

An Act Concerning the State Board of Education for the Blind.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

Section 1. The right to visit, inspect and report concerning the Connecticut Institute for the Blind is hereby vested in the board of education for the blind.

Sec. 2. No member of the Board of Education for the Blind shall be an officer or trustee of the Connecticut Institute for the Blind, or a member of the advisory board of said institution, or in any way connected therewith.

Sec. 3. All of the departments of said Connecticut Institute for the Blind shall be visited and thoroughly inspected as often as once in three months by at least two members of the Board of Education for the Blind, without previous notice of such visits being given to the persons in charge of such departments.

Sec. 4. Said Board of Education for the Blind shall, annually, on or before the Monday after the first Wednesday in January, submit to the Governor its report, containing a statement of the doings of the board during the preceding year; an account of the condition, financial and otherwise, of the Connecticut Institute for the Blind, and its various departments; the number of its inmates; the number of blind persons from this state being educated in other institutions, under the provisions of section 2290 of the General Statutes, and such other information as will apprise the General Assembly of the true condition, progress and needs of blind persons who are residents of this state and who are receiving instruction under the provisions of Chapter 143 of the General Statutes relating to the education of the blind, and of all other blind persons who are residents of this state whose cases have come to the knowledge of said board.

Sec. 5. This act shall take effect from its passage.

Approved May 18, 1905. (Chapter 66.)

CONNECTICUT.

Chapter 143.

Education of the Blind.

2285. *Blind Persons, to Be Educated by the State.* All blind persons; or persons so nearly blind that they cannot have instruction in the public schools, who are of suitable age and capacity for instruction in the simple branches of education and who are legal residents of this state, on the affirmative vote of three members of the Board of Education of the Blind, shall be entitled to receive instruction and for a length of time as may be deemed expedient by said board. The expense of such education shall be paid by the state, to an amount not exceeding three hundred dollars for each of said persons in any one year, except that where the parents of such blind person are not able to provide for his clothing and transportation an additional sum of thirty dollars per year may be allowed for those expenses.

2286. *Board of Education of the Blind.* The Board of Education of the Blind shall consist of four members, of whom the Governor of the state and the Chief Justice of the Supreme Court shall be permanent members. The other two members shall be appointed by the Governor, and shall be a man and a woman, both residents of this state, whose term of office shall commence on the first of July, in the year when they are appointed, and shall continue for four years. The Governor may for reasonable cause remove the appointive members and appoint other persons to fill the vacancy for the unexpired term. The Chief Justice may appoint as a member in his place any judge or ex-judge of the Supreme or Superior Court, such appointment to be for two years from its date.

2287. *Meetings of the Board.* Said board shall meet annually on the first Monday of July at the capitol, and may meet at any other time upon the call of the secretary of the board; and the secretary shall call a meeting at the request of two members of the board. The Governor, or in his absence, the judicial member, shall be chairman of the board. The board shall adopt rules for its own action, and for determining what persons shall receive its benefits.

2288. *Secretary and Treasurer—Expenses.* The board shall appoint a secretary, who shall also act as treasurer, and prescribe his duties and compensation, which office shall be held subject to the pleasure of the board. No member of the board shall receive compensation for services rendered unless such services shall be special and specially requested by the board, in which case a moderate allowance may be made for the time actually spent. The actual and necessary expenses of the members and of the secretary shall be paid, and a certified statement of such expenses and of the amount paid for the salary of the secretary and as compensation for special services of the members shall be filed with the Comptroller within one month after the termination of each year.

2289. *Salary and Expenses of the Secretary.* The salary of the secretary shall be paid monthly, and all other bills for services and expenses at the end of the year, and the certificate of the Governor, of the amount, shall be a sufficient warranty to the Comptroller for the payment of the same, a certificate of the items being first filed with him

as above provided. The tuition and other expenses of the beneficiaries shall be paid quarterly by the Comptroller upon the certificate of the Governor or judicial member as to the amount, which certificate shall be accompanied with a detailed statement of the items. No expense shall be incurred except on the affirmative vote of three members of said board.

2290. *May Contract with Institution for Instruction of Blind.* The board may contract with institutions having facilities for the instruction of the blind for the education of blind persons from this state found by the board to be fitted for such instruction, but within the expenditure therefor provided in Sec. 2285.

2291. *Compulsory Attendance May Be Enforced.* The board may compel attendance of any minor blind child at any such institution; and if the parents or guardians of such child shall not assent thereto, the Judge of Probate in the district where said child resides shall, on the application of a member of said board, and after reasonable notice to the parents or guardians of the time and place for the hearing of said application, inquire into the facts; and if said Judge shall find that the sight of such child is so impaired as to disable it from attending and receiving instruction at ordinary public schools he shall issue his order placing said child in the care and custody of said board until further order of said court, and said order shall give to said board all the rights and authority of a parent over said child.

2292. *Power to Receive Bequests.* The Connecticut institute and industrial home for the blind shall remain as established and is empowered to receive, hold, invest, or employ, as it may deem for the best interests of said institution, any and all property; of whatever nature which may come to it by gift, bequest or devise, or which it may acquire in any manner; but the general assembly may, at any time, limit the amount of property to be so held or acquired. All property of said institution shall be exempt from taxation.

2293. *Exemption from License Fees.* Any goods, wares, or merchandise, manufactured or produced in whole or in part by said institution in furtherance of its purpose to instruct or employ the blind, may be sold or exchanged in any town, city, or borough in this state, and neither said institution, its agents, nor its employees shall be required to procure a license therefor, and no law providing for the payment of a license fee for such privilege shall apply to said institution, its agents or employees, unless it or they shall be particularly referred to in its provisions.

2294. *Instruction in Useful Occupation.* Every blind or partially blind male person over eighteen years of age, who is a beneficiary of the state in the department of industrial training in any institution, shall be given at the expense of the state, for a period not exceeding three years, practical and uninterrupted instruction in some useful occupation conducive to his future self-support.

2295. *Trade Implements May be Provided; Expense of Same.* At the termination of the period of industrial training of every such person the state authorities having in charge the industrial education of the blind shall be empowered to provide, under such conditions as said authorities may deem necessary, machinery, tools and materials

to the amount of not more than two hundred dollars in any one case, for the purpose of establishing every such blind or partially blind person in some useful occupation conducive to his self-support. The expense of providing said machinery, tools, and materials, shall be met from the appropriation made biennially by the general assembly for the education of the blind.

CONNECTICUT.

(Abstract taken from the last United States Census)

The blind are especially exempted from the penalties of the law applying to tramps (1902).

The property to the amount of \$3,000 of any person who, by reason of blindness, is unable by his labor to support himself and family is exempt from taxation (Laws 1913).

DELAWARE.

1913.

An Act Establishing the Delaware Commission for the Blind; Defining the Duties and Powers of said Commission and Providing for an Appropriation to Pay the Expenses Thereof.

Approved March 31, 1909. Amended March 31, 1911. Amended February 24, 1913.

Be it enacted by the Senate and House of Representatives of the State of Delaware in General Assembly met:

Section 1. That a commission to be known as "The Delaware Commission for the Blind" be and the same is hereby created and established, to have supervision and control of the education, training and welfare of blind persons residing in the state of Delaware. Said The Delaware Commission for the Blind shall consist of seven members, who shall be appointed by the Judges of the Superior Court of the state of Delaware, within one month after the passage of this act or as soon thereafter as may suit the convenience of said Judges. Each county of this state shall be entitled to the appointment of at least one member of said The Delaware Commission for the Blind. Said commissioners shall respectively hold office for the term of five years or until their successors are duly appointed. All vacancies on said The Delaware Commission for the Blind, whether occurring by expiration of term or otherwise, shall be filled by said Judges of said Superior Court. No person shall be ineligible to appointment by reason of sex to serve on said The Delaware Commission for the Blind.

Sec. 2. The said The Delaware Commission for the Blind shall organize by the selection from its members of a chairman, a treasurer, a secretary and such other officers as are or may be deemed advisable, and shall make such rules and regulations for its own conduct as may be deemed advisable. No member of said The Delaware Commission for the Blind shall receive any salary or compensation for services as such commissioner.

Sec. 3. The said The Delaware Commission for the Blind shall have general supervision and control of the education, training and welfare of blind persons residing in the state of Delaware, and for that purpose shall from time to time select and appoint a suitable person or persons to be instructors of the blind, which said instructors shall at all times

be under the sole control of said The Delaware Commission for the Blind, and shall be employed upon such terms, and shall do and perform such duties for such periods and in such manner as shall be determined by said The Delaware Commission for the Blind. The said The Delaware Commission for the Blind is authorized and empowered to expend such sum or sums of money as it shall deem proper and necessary for effectuating the objects of this Act, provided, however, that said sums of money shall not in the aggregate in any one year exceed the sum of money hereinafter appropriated to said The Delaware Commission for the Blind for such purposes.

Sec. 4. Any adult indigent blind person who is a resident of the state of Delaware may make application to said The Delaware Commission for the Blind to receive instruction and training from said instructors, said application shall be in writing and shall be endorsed by at least two (2) substantial citizens residing in the community in which the applicant resides. The said The Delaware Commission for the Blind shall have full authority to pass upon said application and may grant or refuse the same in their discretion. They shall indicate at what time said instruction shall commence, for how long it shall continue, and when it shall determine, and they may discontinue said instruction at any time when to them it shall seem wise or proper so to do.

Sec. 5. It shall be the duty of every parent, guardian or other person having custody or control of a blind child or blind children between the ages of seven and eighteen years residing in this state to cause said blind child or blind children to receive instruction and training adapted for blind persons, for at least six months in each year until said child or children have attained the age of eighteen years. Any blind child may be excused by said The Delaware Commission for the Blind from receiving said instruction and training upon the presentation to said The Delaware Commission for the Blind of satisfactory evidence that said child is not in proper physical or mental condition to receive said instruction and training. Said parent, guardian or other person having custody or control of any blind child or blind children shall make application to said The Delaware Commission for the Blind for instruction and training for said child or children, upon receipt of a notice from said The Delaware Commission for the Blind to that effect. Said The Delaware Commission for the Blind may recommend to the Governor of this state that said applicant be placed in an institution for the instruction and training of blind persons. The Governor may grant or refuse such application in his discretion, and he is hereby vested with all the powers and discretion in regard to such application and recommendation as he, by law now has, in cases where application for instruction of indigent blind children is made through the Judges of the Superior Court of this state.

Sec. 6. Every parent, guardian or other person having control of a blind child or blind children, violating any of the provisions of this act shall be guilty of a misdemeanor, and shall, upon conviction thereof before a Justice of the Peace of the state of Delaware, be subject to a fine of not less than two dollars, nor more than ten dollars, to be collected as like fines and penalties are now by law collectible, and in

default of the payment of said fine to undergo an imprisonment not exceeding ten days. Any person so convicted shall have the right to an appeal of the Court of General Sessions of the county in which said conviction was had, upon giving bond in the sum of one hundred dollars to the state with surety satisfactory to said Justice of the Peace by whom said person was convicted. Such an appeal shall be taken and bond given within three days from the time of conviction.

Sec. 7. This act shall not apply to any blind child or blind children who are being otherwise instructed and educated in a manner satisfactory to said The Delaware Commission for the Blind.

Sec. 8. Said The Delaware Commission for the Blind shall have full power and authority to purchase or otherwise acquire, to hold, own, mortgage, sell or assign real and personal property, to accept and receive any private funds, bequests, legacies or gifts of property, real and personal, to be used for the education and training of blind persons, and to hold, manage and invest the same and collect and disburse the principal thereof in accordance with the directions of the parties devising or donating the same; and in default of any such direction, then the said The Delaware Commission for the Blind shall accept, hold, manage and dispose of said property and disburse the income thereof in any manner which it may deem best adapted to promote the education, training and welfare of blind persons residing in the state of Delaware. Said The Delaware Commission for the Blind may hold, own, sell and dispose of any such property, real, personal or mixed, so purchased or received as aforesaid, and may reinvest the proceeds from the sale of any of said property and collect and disburse the income therefrom and the principal thereof in the manner above outlined.

Sec. 9. There shall be appropriated annually for the purpose of said commission the sum of three thousand dollars (\$3,000), and the State Treasurer is hereby authorized and directed to pay to the treasurer of said commission in the month of April in each year said sum of three thousand dollars (\$3,000), the first payment to be made in the month of April, A. D. 1911.

Sec. 10. The said The Delaware Commission for the Blind is, and it is hereby authorized, and it is hereby made its duty, to appoint a representative to visit, during the months of April and October in each and every year, the institutions outside of this state wherein the indigent blind, deaf, dumb and idiotic children of this state are maintained and instructed, in order to ascertain whether or not they are receiving proper treatment and instruction and are making such improvement or advancement as will justify the state in incurring the necessary expense attached to their remaining in said institutions, and the said commission shall make a detailed report of such investigation, in writing, annually to the Governor.

Sec. 11. The lands, tenements and property of said The Delaware Commission for the Blind shall be exempt from any and all state, county and municipal taxes during such time and to the extent that such lands, tenements and property shall be actually by said commission in its work for the blind of this state, provided that said exemption shall not apply to any lands, tenements and property owned by said

commission as investments, and not actually used by said commission in its work.

Sec. 12. That the act entitled "An Act to Provide for the Education and Training of the Indigent Adult Blind Persons of the State of Delaware," as it appears in Chapter 142 of Volume 24, of the Laws of Delaware, be and the same is hereby repealed.

DISTRICT OF COLUMBIA.

(Abstract taken from the last United States Census.)

Education of the Indigent Blind.

Whenever the Secretary of the Interior is satisfied by evidence produced by the president of the Columbia Institution for the Deaf that any blind person of teachable age can not command the means to secure an education, he may cause the person to be instructed in some institution for the education of the blind, in Maryland, or some other state, at a cost not greater for each pupil than is or may be for the time being paid by the state, and to cause the same to be paid, one-half out of the treasury of the United States. Since 1908 the District Commissioners have been required to make the contract for the education of indigent blind children.

FLORIDA.

1914.

(Abstract taken from the last United States Census.)

School for the Blind.

The State Board of Control has charge of the control and management of the Florida School for the Deaf and Blind. Any blind person residing in the state between the ages of 6 and 21 years may, upon certification of his application by the commissioner of his county of residence, be received into the school. No blind person who is making marked progress on reaching the age of 21 years may be dismissed from the school excepting at his own option until he has graduated. The county commissioners pay all transportation expenses and the state pays all the expenses for clothing, food and other necessities. Those who are able are required to pay all the necessary expenses, tuition excepted. The board, upon the recommendation of the superintendent, may allow pupils to remain after they reach the age of 21 years.

GEORGIA.

1852.

Act of Incorporation—An Act to Incorporate and Endow the Georgia Academy for the Blind.

Section 1. Be it enacted by the Senate and House of Representatives of the State of Georgia in General Assembly met, and it is hereby enacted by the authority of the same, that Nathan C. Munroe, Absalom H. Chappell, John B. Lamar, Edwin B. Weed, James M. Green, Edwin Graves and Robt. A. Smith, Trustees of the Georgia Academy for the Blind, and all who, according to the constitution and laws are, or shall become members thereof, be and they are hereby declared to be a body corporate, by the name and style of "The Georgia Academy for the Blind," and by the same corporate name shall have perpetual succession, be capable to buy, hold and sell real and personal estate, make con-

tracts, sue and be sued, to use a common seal, or to break or renew the same at pleasure.

Sec. 2. And be it further enacted, That the said academy shall be governed by such constitution and laws as are now in existence, until the same be altered by the members thereof, and that the members of said academy shall have power to make, alter or repeal their constitution and laws in such manner as they shall deem expedient: Provided, that nothing in the same be contrary to the constitution and laws of this state or of the United States.

Sec. 3. And be it further enacted, That the trustees of said academy shall be empowered to receive all gifts, grants, legacies, privileges and immunities, which now belong to said academy, or which hereafter may be made or bequeathed to it, and no misnomer of the corporation, or other technical error, shall prevent its right from vesting wherever it may appear, or shall be ascertained, that it was the intention of the party or parties to give, grant or bequeath any property, real or personal, or any right or interest to the said corporation.

Sec. 4. And be it further enacted, That the trustees aforesaid shall have the power of appointing such officers, teachers and matrons as may be necessary for said academy, to fix their salaries and prescribe their duties, and the same, or any of the same, to remove or discontinue when they may think proper.

Sec. 5. And be it further enacted, That the trustees aforesaid shall have a general supervision and control over the affairs of said academy, shall prescribe the course of studies, establish the rates of tuition, adjust the expenses, and adopt such regulations, not otherwise provided for, as the interest of the academy may require.

Sec. 6. And be it further enacted, That the trustees aforesaid shall select indigent blind persons from different counties of the state, between the ages of twelve and twenty, and maintain and educate them gratuitously so far as the funds of the said academy will admit; the said trustees, shall present an annual report to his excellency the governor, containing the number of such indigent pupils, with their names and places of residence; also a detailed report of the condition of said academy, and of the number of pupils therein, accompanied with a statement of all its receipts and expenditures during the preceding year.

Sec. 7. And be it further enacted, That to aid the funds, and defray the expenses of the said academy, his excellency the governor is hereby authorized and required to draw his warrant on the state treasurer, in favor of the trustees aforesaid, for the sum of five thousand dollars, to be paid in the year eighteen hundred and fifty-two, and shall draw his warrant on the state treasurer, in favor of the said trustees, for the further sum of five thousand dollars, to be paid in the year eighteen hundred and fifty-three.

GEORGIA.

1914.

Academy for the Blind.

Sec. 1401. *Location, etc., of Academy for the Blind.* An institution for the education of the blind is located at Macon under the control of seven trustees already appointed.

Sec. 1402. *Trustees, a Body Corporate.* They are a body corporate and have all the powers and duties appertaining to similar institutions of this state, in their corporate capacity as trustees of the Academy for the Blind.

Sec. 1403. *Powers of Trustees.* The trustees have the power: 1. To appoint such officers, teachers and matrons as may be necessary; to prescribe their duties, fix their salaries, and to remove or discontinue them at pleasure. 2. To prescribe the course of studies, establish the rates of tuitions, and adjust the expenditures of the institution. 3. To adopt such rules and regulations, not in conflict with law, as the interest of the academy may require.

Sec. 1404. *Education of the Indigent Blind.* All indigent blind persons between the ages of seven and twenty-five years, who shall have given satisfactory evidence of having been a resident of this state for at least two years prior to his or her application, shall be selected by the trustees from the different counties of the state, received into the academy, and supported and educated gratuitously to the extent the funds will permit.

Sec. 1405. *Applicants, How Appointed.* When there are more applicants than can be accommodated, they shall be apportioned among the several counties, according to representative population.

Sec. 1406. *Number of Pupils, How Regulated.* Unless the funds will otherwise permit, there shall hereafter be but one indigent pupil from the counties applying and in case there are not means enough to receive one from every county applying, those shall be received first who first make application. A beneficiary shall not remain at the charge of the institution for longer than four years.

Sec. 1407. *Pay Pupils, How Received.* All others than the indigent are to be received on such terms as the trustees may impose.

Sec. 1408. *Treasurer Must Give Bond.* The treasurer of the board shall give bond and security in the sum of three thousand dollars.

Sec. 1409. *Trustees Must Report to Governor.* The trustees must make annual reports to the governor of all the affairs of the institution, sending therewith the annual report of the superintendent or principal, and shall propose such alterations and improvements as they may desire, which the governor shall lay before the general assembly with his annual message.

Sec. 1410. *Board of Visitors.* The governor shall appoint a board of ten visitors for said academy, who shall meet the board of trustees at the academy annually, at such time as the latter may designate.

Sec. 1411. *Powers and Duty of Visitors.* Said board of visitors shall report to the governor such matters as they deem advisable, which report shall be by the governor laid before the general assembly in connection with his annual message.

Sec. 1412. *Vacancy in Board of Trustees, How Supplied.* The trustees fill vacancies in their own body. When a vacancy occurs and is filled, it must be reported to the governor. Their ineligibility is likewise the same as those last mentioned.

Sec. 1413. *Statistics of the Blind, How Obtained.* The receiver of each county must keep a column for and receive the number of blind between the ages of seven and twenty-five, a statement of which shall

be obtained annually by said board of trustees from the comptroller general's office. Before the digest is sent by the tax receiver to the comptroller, the ordinary of each county shall examine (with such receiver) his list of the blind, and correct (by memoranda thereto attached) and mistake.

Sec. 1414 (1317). *List of Indigent Blind.* The ordinary shall also take down the names of such as are indigent, and procure their admission into the asylum if possible; and if from any cause, they are not received, he shall report to the board of trustees the names, ages and sex of such, who shall keep a record of all such reports.

Sec. 1415. *Laws Kept in Force.* Section 1396 (as to laws kept in force), applies to the asylum for the blind.

IDAHO SCHOOL LAWS.

Chapter III.

School for Deaf, Dumb and Blind.

Sec. 800. *Board of Education May Make Arrangements.* The State Board of Education is hereby empowered and authorized to make the necessary arrangements for the education of the deaf, dumb and blind of this state, including the providing of a suitable building therefor, and equipping the same so far as may be necessary, including also the arranging for the conveyance of the scholars to and from the school at the expense of the state, and including the hiring of a superintendent, instructors and employes, and the fixing of their compensation, and such other matters as may be necessary to carry into effect the provisions of this chapter: Provided, however, that the State Board of Education may, if it becomes necessary, enter into contract with one or more of the adjacent states or territories (having an institution for the education of the deaf, dumb and blind) for the education of the deaf, dumb and blind of the state of Idaho, upon the most economical terms possible: Provided, however, that if it should become necessary to make any such contract, no more than three hundred dollars per year shall be paid for each scholar's instruction and board, including board during vacation.

Sec. 801. *Examination of Applicants.* The State Board of Education is authorized to provide for the careful examination of all applicants for admission to the school to be provided by the said board, and the expenses of the said examinations, and for other expenses in connection with the education of the deaf, dumb and blind, under the authority conferred by this chapter, shall be paid out of the state treasury, as provided by law.

Sec. 802. *Definition of Deaf and Blind.* All children between the ages of six and twenty-one years, who are too deaf or too blind to be educated in our public schools, shall be deemed deaf and blind for the purposes of this chapter.

Sec. 803. *Census of Deaf, Dumb and Blind.* It shall be the duty of the Board of Education to ascertain the number of deaf, dumb and blind children in the state, as defined by the preceding section, and as soon as practicable thereafter, to take the necessary steps for their education, as provided for in this chapter.

Sec. 804. *Same—Duty of District Census Marshals.* ~It is hereby made the duty of the census marshal of each school district in the state

of Idaho, when he shall enumerate the children of school age in his district, to carefully ascertain what children in that district are deaf and blind, as defined in Section 802, and he shall note the name, age and sex of such child or children, also the name of parents or guardian or other person having the legal or actual charge of such child or children, and shall report the same to the county superintendent of public instruction and said county superintendent of public instruction shall immediately report the same to the state superintendent of public instruction.

IDAHO.

House Bill No. 194.

An Act to provide for the establishment, building and equipment of a State School for the Deaf and Blind; to provide for the management thereof by the State Board of Education and to provide for the issuance, sale and redemption of bonds to raise money for the purchase of a site and for the building and equipping of said school.

Be it enacted by the Legislature of the State of Idaho:

Section 1. A state school for the education of the deaf and the blind children of this state is hereby established to be called "State School for the Deaf and the Blind."

Sec. 2. The governor of the state of Idaho and the State Board of Education are hereby empowered and authorized to select a suitable site and to purchase for the state such lands as the board may deem suitable as a site for said school. The State Board of Education shall have power to advertise and receive bids for the building of said bill and to let contracts for all work to be done in the erection, constructing and equipping of said school, at a cost to the state not to exceed twenty-five thousand dollars (\$25,000) to include the purchase of necessary lands, building and equipment, and the board shall have the direction, control and management of said school. The board shall arrange for the conveyance of scholars to and from the school at the expense of the state, shall hire a superintendent, instructors and employes, and fix their compensation, and shall have power to make all needful rules and regulations to carry into effect the general powers of management and control hereby conferred.

Sec. 3. The State Board of Education is authorized to provide for the careful examination of all applicants for admission to the school to be provided by said board, and the expenses of said examination and all other expenses in connection with the education of the deaf and blind, under authority conferred by this act, shall be paid out of the state treasury, as provided, as provided by law.

Sec. 4. All children between the ages of six and twenty-one years who are too deaf or too blind to be educated in our public schools, shall be deemed deaf and blind for the purposes of this act.

Sec. 5. It shall be the duty of the Board of Education to ascertain the number of deaf and blind persons in the state as defined by the preceding section, and, as soon as practicable thereafter, to take the necessary steps for their education as provided for in this act.

Sec. 6. It is hereby made the duty of the census marshal of each school district in the state of Idaho, when he shall enumerate the children of school age in his district, to carefully ascertain what chil-

dren in that district are deaf and blind, as defined in Section 4, and he shall note the name, age and sex of such child or children, also the name of parents or guardian or other person having the legal or actual charge of such child or children, and shall report the same to the County Superintendent of Public Instruction, and said County Superintendent of Public Instruction shall immediately report the same to the State Superintendent of Public Instruction.

Sec. 7. And for the purpose of purchasing lands, creating and equipping a suitable building for the State School for the Deaf and Blind, a loan of twenty-five thousand dollars (\$25,000) is hereby authorized upon the faith and credit of the State of Idaho, to be negotiated by the board consisting of the Governor, Treasurer, Secretary of State and Attorney General of the State of Idaho, and the State Treasurer is hereby authorized, empowered and directed, immediately upon the passage of this act, to issue twenty-five bonds of the State of Idaho, to be known as the State Deaf and Blind Building Bonds, in the sum of one thousand dollars (\$1,000) each, payable in twenty years from the date of their issuance, to bear interest at a rate not to exceed four per cent annum, payable semi-annually, on the first days of April and October of each year, at a bank in the City of New York, to be selected by the State Treasurer. Said bonds, however, to be redeemable at the option of the State of Idaho at any time after the expiration of ten years from the date of their issuance. Said bonds shall be numbered from one to twenty-five consecutively.

Sec. 8. That the State Treasurer is hereby authorized, empowered **and directed to cause to be printed or lithographed** suitable bonds in proper form with coupons attached for the purpose of this Act. All such bonds shall be signed by the Secretary of State, with his own proper name, affixing his official character and shall be authenticated by the great seal of the State and shall be countersigned by the Governor of the State with his own proper name, affixing his official character, and shall then be delivered by the Secretary of State to the State Auditor, who shall make and keep a register of such bonds, showing the number and amount of each bond, and to deliver the said bonds to the State Treasurer and charge the State Treasurer on the books of the Auditor's office with the full amount of each bond.

Sec. 9. That at the time of the issuing of said bonds under the provisions of this Act, the State Treasurer shall sign them with his own proper name, affixing his official character, and shall in like manner sign the coupons thereto attached, and such signing shall bind the State. The coupons for the payment of interest shall be attached to said bonds in such manner that they may be taken off without mutilating or injuring the bonds, and shall be severally numbered from one (1) to twenty-five (25), each bearing the corresponding number of the bond to which it is attached. The Treasurer shall keep a record of all bonds issued by him, showing the date of issuance, and shall deliver said bonds, with the coupons attached as aforesaid, to the purchaser or purchasers, upon the receipt of the purchase money therefor; and the money received from the sale of said bonds shall be by said Treasurer placed in a certain fund to be known as the "State Deaf and Blind School Building Fund." The expenses of procuring said bonds with

coupons attached shall be paid out of the funds arising from the sale of said bonds.

Sec. 10. For the purpose of creating a fund to pay interest and principal of said bonds, an annual ad valorem tax of four mills on each hundred dollars (\$100.00) of the assessed valuation of all property in the State not exempt from taxation is hereby levied, and shall be collected as other taxes for State purposes.

Sec. 11. If at any time there should not be sufficient money in the said State Deaf and Blind School Building Bonds Fund to pay the interest coupons on the principal of such bonds when due, the State Treasurer shall pay the same out of the general fund of the State, and shall replace the amount so paid out of the State Deaf and Blind School Building Bonds Fund whenever moneys for said fund shall be received.

Sec. 12. For the payment of bonds herein authorized and the interest thereon according to the strict terms thereof, the faith of the State of Idaho is hereby solemnly pledged; and for the payment of the interest thereon as same shall accrue on the bonds thereby authorized in lawful money of the United States the Treasurer shall reserve any and sufficient funds in his hands, at the least possible cost in preference to all other claims whatsoever, except the other bonds heretofore authorized by the Legislature of Idaho.

Sec. 13. The Treasurer shall commence negotiations for the issuance and sale of the bonds herein provided for, immediately upon the passage and approval of this Act.

Sec. 14. That at any time after ten years from the issuance of said bonds whenever there shall be five thousand dollars (\$5,000) of said sinking fund the Treasurer of the State of Idaho shall make a call by publication for sixty (60) days in some daily newspaper of this State, notifying all the parties interested that certain bonds of the State Deaf and Blind School Building Bonds provided by this Act, giving their number, will at a certain date be paid at the office of said Treasurer, and the bonds so called shall cease to bear interest from and after the date in said call specified.

Sec. 15. Chapter 3, Title 6, of the Political Code, Revised Codes of Idaho, and "An Act entitled 'An Act to provide for the education of the deaf, dumb and blind,'" approved March 12, 1907, and all other acts and parts of acts in conflict herewith are hereby repealed.

Sec. 16. Whereas, an emergency exists therefor, this act shall be in force from and after its passage and approval.

Approved March 16, 1909.

IDAHO.

1917.

SENATE BILL NO. 37.

AN ACT

To Provide Relief for Needy Blind Persons.

Be It Enacted by the Legislature of the State of Idaho:

Section 1. That it shall be lawful for and obligatory upon any county to contribute such sum, or sums, of money as hereinafter specified from the general funds of said county toward the support of any blind person who comes under and complies with the provisions of this act.

Sec. 2. Any male person of the age of twenty-one years or over, and any female person of the age of eighteen years or over, who by reason of loss of eyesight is unable to provide himself or herself with the necessities of life, and who unless relieved as authorized by the provisions of this Act would become a charge upon the public or upon those not required by law to support him or her shall be deemed a needy blind person.

Sec. 3. In order to be entitled to relief under the provisions of this act a needy blind person must become blind while a resident of this state, or be a bona fide resident of the state for a period of seven years immediately preceding the application for relief and of the county for three years immediately preceding the application for relief; Provided, that in cases where the blindness ensues in this state after a period of residence less than that specified in this section, it shall be the duty of the officer hereinafter designated to authorize the granting of relief to ascertain by sufficient evidence that the removal to this state and to county in which relief is applied for, was not primarily for the purpose of securing relief under the provisions of this act.

Sec. 4. Claims for relief hereunder shall be made by the claimant filing with the probate judge a duly verified statement of the facts bringing him or her within the provisions of this act. The list of claims shall be filed in a book furnished for that purpose by the County Commissioners in the order of filing, which record shall be open to the public. No certificate of qualification for drawing money hereunder shall be granted until the probate judge shall be satisfied from the evidence of at least two reputable residents of the county, one of whom shall be a registered physician skilled in treatment of diseases of the eye, and neither of them a relative of the applicant, that they know the applicant to be blind and that he has the residential qualifications to entitle him to the relief asked. Such evidence shall be in writing, subscribed to by such witnesses who shall be subject to cross-examination by the probate judge, or other person. If the probate judge is satisfied upon such testimony that the applicant is entitled to relief hereunder, he shall issue an order therefor, in such sum as he finds needed, not to exceed one hundred and eighty dollars per annum, to be paid quarterly from the general funds of the county on the warrant of the County Auditor; Provided, that in case any family contains two or more blind persons, the total sum for such family shall not exceed two hundred and fifty dollars per annum. The relief herein provided shall be in place of all other relief of a public nature.

Sec. 5. If in the examination of the qualifications of any person filing a claim for relief, or having a place on the list of those receiving benefit hereunder, it shall be determined upon the evidence of a registered physician, qualified as set forth in Section 4, that any person or persons making such claim, or then on such list, might have such disability benefited or removed by proper surgical operation or medical treatment, and if such person entitled to such relief files his consent in writing thereto, then the probate judge may order expended for the purpose of such surgical operation or medical treatment all or any portion of the relief, which he may award to such person for one year under the provisions of this Act, and in such case the warrant of the

County Auditor shall be issued direct to the persons entitled to compensation for such surgical operation, or medical treatment upon the certificate of the probate judge instead of being payable quarterly to the person entitled to such relief.

Sec. 6. Any applicant for relief, or any person appearing in behalf of any applicant for relief hereunder who makes a false statement, shall, upon conviction be deemed guilty of perjury and punished accordingly.

PUBLIC LAWS OF ILLINOIS.

1849. Page 39.

An Act to Establish the Illinois Institution for the Education of the Blind.

Section 1. Be it enacted by the people of the State of Illinois, represented in the General Assembly, That Samuel D. Lockwood, Dennis Rockwell, James Dunlap, William W. Happy and Samuel Hunt are hereby constituted a body politic and corporate, by the name of the "Illinois Institution for the Education of the Blind," and by that name they and their successors shall have perpetual succession and existence, with power to contract and be contracted with, to sue and be sued, to plead and be impleaded, to make and use a common seal and alter the same at pleasure, to take or receive, by grant deed, devise, bequest or otherwise, property, real, personal and mixed, and have, hold, use, enjoy and convey the same; to adopt by-laws not inconsistent with the constitution and laws of the land, and to do all other acts necessary to the proper exercise of the powers, herein conferred.

Sec. 2. The object and duty of the corporation shall be to continue and maintain the school for the education of the blind established in Jacksonville; and to qualify, as far as practicable, that unfortunate class of persons for the enjoyment of the blessings of free government, obtaining the means of subsistence, and the discharge of those duties, social and political, devolving upon American citizens.

Sec. 3. The school shall be continued in or near Jacksonville, and the corporation shall, as early as practicable, purchase a suitable lot of ground, containing not less than ten nor more than forty acres, and proceed to erect thereon suitable buildings, and make such improvements as are necessary for the school.

Sec. 4. The persons named in the first section of this act, and their successors, shall be the trustees of the school, to whom power is given to employ the principal and all teachers, prescribe their duties, fix their compensation, and the price of instruction; prescribe the course of study, fix the price of board, and all other persons necessary to the maintenance and to carry on the operations of the school.

Sec. 5. All blind persons residing in Illinois, of suitable age and capacity to receive instruction, shall be received and taught in the said school, and no one of such persons shall be excluded from the privilege and benefits thereof by reasons of the reception of persons from other states or territories.

Sec. 6. The said corporation shall not take or hold property of any kind or description, or by any tenure, except such as may be for the use of the school and other purposes contemplated in this act.

Sec. 7. The trustees for the time being shall be severally liable for

the faithful application of all property, funds and effects which may be received for the use of the institution; and property, funds and effects received by gift, grant, donation, devise, or bequest shall be applied as directed by the person from whom received.

Sec. 8. The officers of the corporation shall be a president, secretary and treasurer, who shall be appointed by the board of trustees; the president to be selected from their own number; the trustees to serve without compensation.

Sec. 9. The trustees mentioned in the first section of this act shall serve as follows, to-wit: Three shall serve for the term of four years, and two for the term of two years, and until their successors are appointed and qualified. The trustees shall meet within thirty days after the passage of this act, and organize, and determine by lot the three that shall serve four years, and the two that shall serve two years. The Governor shall appoint their successors, whose appointments shall commence on the fourth of March, and continue for four years, and until their successors are appointed and qualified.

Sec. 10. The officers of the school shall be a principal, who shall have the general charge of the school, and such teachers as may from time to time be appointed. The academic and literary degrees unusually conferred by institutions for the education of the blind, shall be conferred by this institution, and diplomas granted accordingly.

Sec. 11. Blind persons who may be placed in this school by or under the authority of the state, or any county, city, town or other public corporation, shall be kept, taught and permitted to enjoy all the benefits and privileges of the school, be furnished with books, boarding, lodging, washing, fuel, lights, and allowed the use of the library, at not exceeding one hundred dollars for the academic year for forty-two weeks. The provisions of this section to apply only to scholars sent from other states.

Sec. 12. To aid in the establishment of the school, there shall be paid to the said trustees, for the use of the institution, the proceeds of a tax of one-tenth of a mill upon every dollar's worth of taxable property in this state; which tax shall be assessed and collected annually with the taxes assessed and collected for the ordinary purposes of government.

Sec. 13. The Treasurer of State shall receive the tax collected for the institution, and keep the same as a separate fund, to be known as the fund for the blind, and pay out the same, from time to time, in such amounts as may be necessary, in the judgment of the board of trustees, in conducting the business of the institution. The Treasurer shall pay out the money on the warrants of the Auditor, issued on the order of the Governor, who is authorized to make the order on the application of the board of trustees.

Sec. 14. For the purpose of enabling the trustees to commence the building of said institution, there is hereby appropriated, out of any money in the treasury not otherwise appropriated, the sum of three thousand dollars; which shall be paid to the trustees on the warrant of the Auditor of Public Accounts, who is authorized to issue the warrant on the order of the Governor, who shall give the order upon the application of the trustees.

Sec. 15. The trustees, before entering upon the duties of their office, shall give bonds, payable to the people of the State of Illinois, conditioned for the faithful discharge of their duties, to be approved by the Governor.

Sec. 16. The blind of this state, who are of suitable age and capacity shall be received and taught in the school, and enjoy all the benefits and privileges of the same, free of charge. This act to take effect from and after its passage.

Approved January 13, 1849.

VOL. 1, PRIVATE LAWS OF ILLINOIS.

1865. Page 68.

An Act to Incorporate the Chicago Charitable Eye and Ear Infirmary.

Whereas, It is a duty of common humanity to relieve the suffering and destitute, and it is for the public good of a state to encourage and aid such institutions as have for their aim to provide for the gratuitous and scientific treatment of diseases of the eye, to secure the necessary aid for themselves, thereby relieving the sufferers from a condition of helplessness, and, many times, the state from the necessity of their support.

Section 1. Be it enacted by the People of the State of Illinois, represented in the General Assembly, That Walter L. Newberry, Luther Haven, Samuel Stone, Ezra B. McCagg, William Barry, William H. Brown, Thomas B. Bryan, Philo Carpenter, Wesley Munger, Eliphalet W. Blatchford, Cyrus Bentley, Flavel Mosley, together with Daniel Brainard, Joseph W. Freer, Edwin Powell and Edward L. Holmes, physicians, all of the City of Chicago, or its vicinity, are hereby declared and created a body corporate, for the purpose aforesaid, by the name of "The Chicago Charitable Eye and Ear Infirmary," and that they and their successors shall have perpetual succession, by the same name.

Sec. 2. Said corporation shall have power to elect trustees and surgeons of the institution, and to choose such officers, and committees, and establish such dispensaries as its interests, from time to time, seem to require; may make a constitution and rules, by which it shall be governed, not repugnant to the constitution and laws of this state, and may change the same, from time to time, at its pleasure.

Sec. 3. Said corporation may adopt and have a common seal, may sue and be sued, prosecute and defend suits, in its corporate capacity, in any of the courts of record in this state, and is hereby licensed and empowered to make, purchase and receive grants, devises and donations of real and personal estate, and the same, or any part thereof, to a lien, sell and convey; but said real and personal estate, exclusive of an infirmary building, shall not exceed in amount the sum of one hundred thousand dollars.

Sec. 4. Walter L. Newberry, or any other person named in this act, is hereby authorized to call the first meeting of said corporation.

Sec. 5. This act shall take effect and be in force from and after its passage.

Approved February 16, 1865.

ILLINOIS LAWS.

1867. Page 25.

INDUSTRIAL HOME FOR THE BLIND.

An Act to incorporate the Illinois Industrial Home for the Blind, and to make an appropriation therefor.

Section 1. Be it enacted by the People of the State of Illinois, represented in the General Assembly: That for the manual training and furnishing of employment to the blind, a corporation is hereby created to be known and designated as the Illinois Industrial Home for the Blind, and to have perpetual succession, with power to contract and be contracted with, to sue and be sued, to plead and be impleaded, to receive by any legal mode of transfer or conveyance, and to have, hold, and use property of every description, but not to sell or convey any such property except the goods, wares, merchandise and other personal property prepared by said Home for sale, and such property shall be held in trust as the property of the state; also to have and use a common seal, with the power to change the same, also to adopt by-laws, rules and regulations for the government of its members, officers, agents, employes and inmates; Provided, such by-laws shall not be contrary to the letter or spirit of the constitution of the State of Illinois, or of the United States.

Sec. 2. The object of said corporation shall be to promote the welfare of the blind by teaching them trades and affording them a home and such employment as shall best tend to make them self-supporting and consequently independent, using therefor the best known means and appliances.

Sec. . The trustees shall not exceed five in number; said trustees shall be appointed by the Governor of the State of Illinois, with the advice and consent of the Senate, shall serve without compensation; their term of service shall be two years respectively, and until their successors are appointed and qualified; Provided, that three of said trustees shall be selected from members of the majority political party of this state, and the remainder from the minority political party or parties.

Sec. 4. Each of said trustees shall be paid his or her traveling expenses while in the service of the Home, out of the funds appropriated for its use, upon filing in the office of the Auditor of Public Accounts the voucher of said trustees, stating in detail the items of all such expenses, and the Auditor shall thereupon issue his warrant upon the State Treasurer in favor of such trustee for the amount thereof and charge the same to the fund appropriated to said institution.

Sec. 5. No trustee shall be directly or indirectly interested in any contract to be made by said trustee, nor shall any of them be appointed to, or employed in any office or position under their control or authority, to which a salary is attached.

Sec. 6. The said trustees shall have charge of the general interests of the Home, and shall annually by ballot elect a superintendent to serve during the will and pleasure of said trustees, who shall fix his salary, which shall not exceed fifteen hundred dollars a year, and he, with their consent, shall employ all necessary assistants, instructors

and other employes. The said trustees, or a majority of them, when regularly convened, shall constitute a board, which shall possess and exert all the powers of said trustees, and shall have power by ballot to elect a president, secretary and treasurer, the president and secretary to be selected from their own number, and said board shall prescribe the duties and fix the terms of service of said officers of said board.

Sec. 7. The superintendent shall exercise official control over all subordinate officers, instructors, assistants and employes, and shall be held responsible for their fidelity.

Sec. 8. Apprentices placed by their parents or guardians in the Home shall be required to conform to its rules and regulations.

Sec. 9. The board shall, annually, before December 15, report to the Governor of the State the number of applications received, persons admitted, instructed and discharged; also the progress made and work accomplished, and all other matters of general interest to the people of the State of Illinois in regard thereto, together with a full, explicit and detailed statement of all money received and disbursed during the year.

Sec. 10. The said trustees shall meet monthly during the first year, and at least quarterly thereafter, to examine and audit all the accounts of the Home, and make requisitions on the Auditor of Public Accounts for funds required for use during the succeeding month or quarter, from funds which have been appropriated for the establishment and maintenance of the Institution.

Sec. 11. The Auditor of Public Accounts is hereby authorized and required to draw his warrants on the Treasurer of the State for all sums which shall or may be appropriated and remain undrawn or unexpended, for the use of said institution, by the General Assembly, upon the order of the Board of Trustees of the Illinois Industrial Home for the Blind, when signed by the president and attested by the secretary of said board with the seal of said institution.

Sec. 12. The sum of one hundred thousand dollars is hereby appropriated for the purchase of lands, grounds or real estate in the County of Cook and State of Illinois, and for the purpose of erecting thereon suitable buildings, and fitting and furnishing the same appropriately for the Illinois Industrial Home for the Blind, and also for the purpose of conducting therein workshops for the manual training and employment of the blind, defraying the expenses of boarding the inmates while necessary, and the payment of its superintendent, instructors, assistants and employes, which sum of money is to be expended under the safeguards hereinbefore provided; Provided, at least the sum of sixty thousand dollars (\$60,000) shall be expended in the purchase of real estate and buildings for the use of said Industrial Home for the Blind, and no more than one thousand dollars (\$1,000) shall be expended in constructing and furnishing rooms for officers; Provided, further, no real estate shall be purchased until the title to the same shall have been examined by the Attorney General of the State.

This bill having remained with the Governor ten days (Sundays

excepted), the General Assembly being in session, it has thereby become a law.

Witness my hand this 13th day of June, A. D. 1887.

HENRY D. DEMENT,
Secretary of State.

PUBLIC LAWS OF ILLINOIS.

1871-72. Page 137.

An Act to create and support a state institution to be called "The Illinois Charitable Eye and Ear Infirmary," for the treatment of needy persons suffering from diseases of the eye or ear.

Whereas, The trustees of the Chicago Charitable Eye and Ear Infirmary, at their regular annual meeting, held January 3rd, Eighteen Hundred and Seventy-one, voted unanimously to transfer all the property belonging to said infirmary to the People of the State of Illinois, on the conditions stated in this act, to be held by the state in trust for the benefit of the poor of the state suffering from diseases of the eye or ear; therefore,

Section 1. Be it enacted by the People of the State of Illinois, represented in the General Assembly, That the Governor is hereby directed to receive, in accordance with a form of conveyance approved by him, on conditions stated in Section 9 of this act, all the property belonging to the Chicago Charitable Eye and Ear Infirmary, together with all the records and accounts of said infirmary.

2. The board of trustees and officers of said infirmary to evidence their assent to this act and the transfer of the property of said infirmary to the state- shall make and enter in their record of proceedings, a minute, accepting this act according to its terms, and transferring to the State of Illinois all the property of said infirmary, a certified copy of which, approved by the Governor, shall be filed with the Auditor of Public Accounts; and said minute shall be a transfer of said property to the state.

3. On and after the passage of this act the name and title of said infirmary shall be "The Illinois Charitable Eye and Ear Infirmary."

4. The Governor, by and with the advice and consent of the Senate, is hereby directed to appoint a board of five trustees of said infirmary. Said trustees and their successors may elect, annually, from their number, a president, a vice-president, and a secretary; may appoint a treasurer and a board of skillful attending and consulting surgeons. It shall further be the duty of this board of trustees to receive, in the name of the state, all donations, gifts, bequests and moneys which may be obtained for said infirmary, and apply the same to the charitable purposes for which they may be received. An exact account of the donations, gifts, bequests and moneys thus obtained shall be rendered annually to the Governor. Said board of trustees may make such by-laws, rules and regulations for the government of themselves, their officers and said infirmary as shall seem to them expedient, not inconsistent with this act.

5. The board of trustees and the board of attending- and consulting surgeons, appointed in accordance with this act, shall all perform their duties without remuneration.

6. When the certified copy of the minute making such transfer, provided for in Section 2 of this act, shall have been filed, the Auditor of Public Accounts is hereby authorized and directed to draw warrants on the State Treasurer, as follows: One, for five thousand dollars, on or before the tenth day of July, in the year of our Lord Eighteen Hundred and Seventy-one; and another, for the like amount of five thousand dollars, on or before the tenth day of July, in the year of our Lord Eighteen Hundred and Seventy-two—each to the order of the treasurer of the trustees of the infirmary, and to deliver such warrants to said treasurer for the support of said infirmary. The money so appropriated shall be expended for the support of needy patients from the State of Illinois suffering from diseases of the eye or ear, who shall present to the superintendent of the infirmary written certificates of their place of residence, and their absolute inability to pay for their board or treatment, signed by the supervisor of the town where they reside, or by their family physician.

7. An exact account of the manner in which this money drawn from the state treasury shall be expended, shall be printed in the annual reports of the infirmary. A statement of all the receipts and expenditures of the infirmary shall be made annually to the Governor.

8. The endowment fund, amounting to six thousand dollars, now held and owned by said infirmary, may be used, if said board of trustees shall determine, in the purchase of a lot or lots for the use of said infirmary.

9. When the General Assembly shall cease to make an appropriation for an annual amount equal to that specified in Section 6 of this act for the support and use of said infirmary, the property conveyed to the state shall revert to the trustees mentioned in Section 2 of this act, or their successors.

Approved April 17, 1871.

ILLINOIS.

An Act for the relief of the Blind. (Approved May 11, 1903.)

Section 1. Be it enacted by the People of the State of Illinois, represented in the General Assembly: That it shall be lawful for and obligatory upon any county to contribute such sum or sums of money from the charity or general funds toward the support of any blind person who may come under the provisions of this act.

2. *Benefit for Blind.* That all male persons over the age of twenty-one (21) years, and all female persons over the age of eighteen (18) years, who are declared to be blind in the manner hereinafter set forth, and who come within the provisions of this act, shall receive as a benefit one hundred and fifty dollars (\$150.00) per annum, payable quarterly, upon warrants properly drawn upon the treasurer of the county of which such person or persons are residents. (Amended by act approved June 25, 1915.)

3. *Who Not Entitled to Provisions of Act.* That no person or persons who are charges of any charitable institution of this state or any county or city thereof, or persons having an income of more than two hundred and fifty dollars (\$250.00) per annum, or persons who have not resided within the State of Illinois continuously for ten (10) consecutive years and in their respective counties three (3) years,

immediately before applying for said benefit, shall be entitled to the provisions of this act.

4. *Duty of Commissioners to Appoint Examiner of the Blind.* It is hereby made the duty of the Board of County Commissioners or Board of Supervisors in each county of this state, to appoint a regular practicing physician whose official title shall be "examiner of the blind," who shall keep an office open in some convenient place during the entire year for the examining of applicants for said benefit. (Amended by act approved June 25, 1915.)

5. *Duty of Examiner of the Blind—Certificate—Register—Compensation.* It is hereby made the duty of the examiner of the blind to examine all applicants for benefit, referred to him by the Board of County Commissioners or Board of Supervisors, and to endorse on the application a certificate to each applicant, showing whether he or she is blind or not. Said examiner shall keep a register in which he shall enter the facts contained in each certificate. He shall be paid from the county treasury for his services the sum of two dollars (\$2.00) for each applicant so examined.

6. *Applicants for Benefit—Affidavits—Duty of County Clerk.* All persons claiming the benefit provided herein may go before the County Clerk of their respective counties, and make affidavit to the facts which bring him or her within the provisions of this act, which shall be deemed an application for said benefits; two citizens, residents of the county, shall be required to make affidavits to the fact that they have known said applicant to be a resident of the county for the three years immediately preceding the filing of said application; the County Clerk shall immediately refer the application to the examiner of the blind for said county. (Amended by act approved June 25, 1915.)

7. *Register to Be Kept by County Clerk—Must Certify at Each Meeting to Commissioners—Time Payment Begins.* The County Clerk shall register the name, address and number of applicant, and date of the examination of each of the applicants who have been so determined to be entitled to said benefit, at each meeting of such County Commissioners or County Supervisors of the county, he shall certify to the County Commissioners or County Supervisors of the county, the name and residence of each applicant, so determined by the examiner to be entitled to said benefit, from and after the first day of the months of January, April, July and October thereafter, to be provided for as set forth in Section 8 of this article. (Amended by act approved June 25, 1915.)

8. *Duty of Commissioners, Etc., to Provide for Payment.* It is hereby made the duty of the Board of County Commissioners or Board of Supervisors of each county in this state to provide in the annual appropriation for the payment of persons so entitled to said benefit, who have complied with the provisions of this act, and to cause warrants on the County Treasurer to be drawn, properly endorsed, payable to each of said persons in said county each quarter in each year thereafter, during the life of said persons, while they are residents of said county or until said disability is removed. Said board shall also provide in the annual appropriation for payment of persons who may become entitled thereto during the year such sum as in their judgment

may be needed for such purpose. (Amended by an act approved June 25, 1915.)

9. *Penalty for False Affidavit.* Any person who shall make a false affidavit in order to secure the benefit herein provided, shall, upon conviction, be deemed guilty of perjury.

ILLINOIS.

(Abstract taken from the last United States Census.)

Board of Administration.

The general supervision of the blind is vested in the board of administration, which has control of state charities and charitable institutions. One member of the board must inspect the Illinois School for the Blind and the Illinois Industrial Home for the Blind, at least once a quarter. The board may employ teachers to instruct the adult blind in industrial pursuits at their homes, aid them to find employment and to market the products of their industry, and develop such occupations as tend to ameliorate their condition and make them self-supporting. (1913.)

Institutions for the Blind.

It is the duty of the charities commission to investigate the system, condition and management of the state institutions for the blind and report the same with recommendations to the Governor. The general inspection of each institution is vested in a board of visitors, composed of three persons, who are appointed by the Governor with the consent of the Senate, one member of the board being a woman. Each member is appointed to serve for six years without compensation other than necessary expenses. Each board must inspect its institution at least once each quarter, and maintain a record of the condition of the institution and its inmates and report to the charities commission. (1913.)

All blind persons residing in the state receive their board, tuition and treatment free at the state school for the blind; those desiring to pay for their education may do so. When there is room, blind residents from other states may enter the school, upon payment for their board, tuition and treatment. In all cases where a person sent to the school is too poor to furnish himself with clothing, and to pay expenses for traveling to and from the school, the county of his residence must pay the expenses, if the judge of the county court, upon application of any relative or friend of the blind person, thinks him a proper subject for the care of the institution. (1913.)

The object of the institution for the education of the blind is declared to be to promote the intellectual, moral and physical culture of the blind, and to fit them, as far as possible, for earning their own livelihood and for future usefulness in society; the object of the industrial home for the blind is set forth as to promote the welfare of the blind by teaching them trades and affording them a home and such employment as shall best tend to make them self-supporting and consequently independent, using therefor the best known means and appliances. (1913.)

Day Schools for the Blind.

Boards of education and school directors may establish and maintain classes and schools for the blind in cities; and the excess cost of

maintaining such classes and schools over the cost for schools for normal children is paid by the state, provided that this excess cost does not exceed the amount of \$160 per each blind pupil. (1913.)

Relief of the Needy Blind.

All males over the age of 21 years and females over the age of 18 years, who are declared blind by the examiner of the blind, not charges of any charitable institution, who have an income of \$250 a year or less, and who have resided in the state continuously for ten consecutive years and in their respective counties three years immediately before applying, are entitled to obtain a benefit of \$150 a year, payable quarterly, from the county of their residence, by order of the Board of County Commissioners or the Board of Supervisors. The Board of County Commissioners or Board of Supervisors in each county must appoint a regular practicing physician as examiner of the blind, who must keep an office open in some convenient place during the entire year for the examining of applicants for this benefit. All persons claiming the benefit may go before the County Clerk of their respective counties and make affidavit to the facts which bring them within these provisions, which will be considered an application for the benefit. Two citizens, residents of the county, are required to make affidavits to the fact that they have known the applicant to be a resident of the county for three years immediately preceding the application. The County Clerk is to refer the application to the examiner of the blind, who must examine all applicants and indorse on the application a certificate showing whether the applicant is blind or not. The examiner received a fee of \$2 for each applicant examined. (Laws 1915.)

INDIANA.

House Bill Uo. 234.

A Bill for an Act concerning the education of the blind in the state universities and the State Normal School.

Section 1. Be it enacted by the General Assembly of the State of Indiana, that whenever any blind person has matriculated in any of the departments of Indiana University, Purdue University or the Indiana State Normal School and shall make formal request therefor, it shall be the duty of the boards of trustees and the executive officers of such institutions to supply free of charge an assistant for at least three (3) hours per day for the purpose of reading to such student under the direction of the faculty of said institution.

Sec. 2. All laws and parts of laws in conflict herewith are hereby repealed.

Committee Report.

Mr. Speaker:

Your Committee on Education, to which was referred House Bill No. 234, has had the same under consideration and begs leave to report the same back to the House with the recommendation that the bill do pass.

KESSLER, Chairman.

INDIANA.

1915.

(Abstract taken from the last United States Census.)

Industrial Aid for the Blind.

The board of trustees of the school for the blind acts as a board of industrial aid for the blind. It is their duty to prepare and maintain a complete register of the blind in the state, which must describe the condition, cause of blindness, and capacity for educational and industrial training of each blind person, together with such other facts as may seem to the board to be of value. The board must act as a bureau of information and industrial aid, the object of which must be to aid the blind in finding employment and to teach them industries which may be followed in their homes, and to provide such means for the development of such industries and for the marketing of the products as may seem expedient. The board may establish schools for the industrial training of the adult blind and workshops for the employment of suitable blind persons, and is empowered to equip and maintain the same, to pay blind persons employed in the workshops suitable wages, and to devise means for the sale and distribution of the products. The board may also provide to pay for, during their training, temporary lodging and support for pupils or workmen received at any industrial school or workshop established by it. The board may ameliorate the condition of the blind by promoting visits among the blind in their homes for the purpose of instruction, and by such other methods as may seem to the board expedient, and by co-operating with the state library in facilitating the circulation of books for the blind. It is the duty of the board in making inquiries concerning the cause of blindness to learn what proportion of these cases are preventable and to co-operate with the State Board of Health in adopting and enforcing proper preventive measures. The State Treasurer is the custodian of all sums received by the board in accordance with these provisions, but they may use any receipts or earnings for the furtherance of the purpose of these provisions. The board also receives an annual appropriation of \$10,000 for this purpose. The board must make an annual report to the Governor and Legislature.

School for the Blind.

The general government and management of the Indiana School for the Blind is vested in a board of trustees consisting of four members appointed by the Governor for terms of four years. Not more than two members of the board may be members of the same political party. The members of the board receive an annual salary of \$300 for their services, and a sum not to exceed \$125 a year for their necessary expenses. The board must meet at least once a month and must make an annual report to the Governor. The school is declared to be purely an educational institution, and is not to be classed as benevolent or charitable. Upon application to the board, accompanied by a certificate from a justice of the peace that the applicant is a legal resident of the county in which it is claimed he resides, any blind person may be admitted to the school for the blind. In all cases where the parents, guardians or friends are able, they must pay for the necessary clothing

and for the traveling expenses to and from the school, and wherever the parents, guardians or friends of the pupils do not do so, the county from which they are sent pays such expenses. The county may collect this amount from the parents, when they are able to pay, but property to the amount of \$300 is exempt from such charges. Pupils from without the state may be admitted to the school on the payment of such sum as the board may consider sufficient to defray expenses. The superintendent of the school for the blind is required to provide for the industrial education of his pupils under similar rules and methods to those of the scholastic education. The industrial education must, as far as possible, be conducted so as to make the pupils fit and able to earn their own support when they leave the school. (1914.)

Compulsory Education.

Parents, guardians or other persons in the state having control or charge of any child, between the ages of eight and sixteen years, who is either totally blind or whose vision is so defective that he is unable to secure an education by sight, are required to send the child to the Indiana School for the Blind during the full scholastic term of that school, unless discharged therefrom or refused admittance thereto by the board of trustees; but if an application for admission to the school is rejected by the board of trustees, the parent, guardian or other person having charge of the child is exempted from any penalty.

The assessors of property are required to make a list of all the blind persons in their districts, setting forth the name, age and sex, and the names of the parents or guardians. Such lists are returned to the Bureau of Statistics, which in turn submits the list to the superintendent of the school for the blind. (1914.)

IOWA.

Supplement to the Code of Iowa.

Chapter 5-B.

Of the State Board of Education.

Section 2682-c. *How Constituted—Institutions Governed.* The State University, the College of Agriculture and Mechanic Arts, including the Agricultural Experiment Station, the Normal School at Cedar Falls and the *College for the Blind at Vinton*, shall be governed by a state board of education consisting of nine members, and not more than five of the members shall be of the same political party. Not more than three alumni of the above institutions and but one alumnus from each institution may be members of this board at one time.

Chapter 9.

Of the College for the Blind.

Section 2715. *Admission.* All blind persons, residents of the state, of suitable age and capacity, shall be entitled to an education in this institution at the expense of the state, and non-residents may also be entitled to the benefits thereof, if they can be accommodated therein, upon paying to the treasurer sixty-six dollars quarterly in advance.

Section 2717. *Report.* On or before the fifteenth day of August in each even-numbered year, the principal of the college shall report to the Governor the number of pupils in attendance, the name, age, sex, residence, place of nativity and cause of blindness, with the studies

pursued, trades taught, and a complete statement of the expenditures made, and the number, kind and value of articles manufactured and sold. Provided that the report for the year Nineteen Hundred and Six shall cover only the period from the date of the last biennial report.

Section 2718-c. *Blind and Deaf Children—Compulsory Education.* Children, residents of the state, between twelve and nineteen years of age, who are so deaf as to be unable to obtain an education in the common schools, and children of such age whose sight is so defective that they cannot attend the public schools, must attend the school for the deaf or the college for the blind during the scholastic year, unless exempted as hereinafter provided.

Supplemental Supplement to the Code of Iowa.

Chapter 10-A.

Of County Aid for the Blind.

Section 2722-i. *Board of Supervisors to Aid the Blind.* That it shall be lawful for any county to contribute such sum or sums of money from the poor fund toward the support of any blind person who may come under the provisions of this act.

Section 2722-j. *Financial Aid From the County.* That all male persons over the age of twenty-one years, and all female persons over the age of eighteen years, who are declared to be blind in the manner hereinafter set forth, and who come within the provisions of this act, shall at the discretion of the County Board of Supervisors, receive as a benefit one hundred and fifty dollars per annum, payable quarterly, upon warrants properly drawn upon the Treasurer of the county of which such person or persons are residents.

Section 2722-k. *Who Are Entitled to Relief.* That no person or persons who are charges of any charitable institution of this state, or any county or city thereof, or persons having an income of more than three hundred dollars per annum, or persons who have not resided within the State of Iowa continuously for five consecutive years and in their respective counties one year, immediately before applying for said benefit, shall be entitled to the provisions of this act.

Section 2722-l. *Examiner of the Blind—Appointment.* It is hereby made the duty of the County Board of Supervisors in each county in this state to appoint a regular practicing physician, whose official title shall be "Examiner of the Blind," who shall keep an office open in some convenient place during the first week of each year for the examining of applicants for said benefit.

Section 2722-m. *Duties of Examiner—Fee.* It is hereby made the duty of the Examiner of the Blind to examine all applicants for benefit referred to him by the County Board of Supervisors, and to endorse on the application a certificate to each applicant, showing whether he or she is blind or not. Said examiner shall keep a register in which he shall enter the facts contained in each certificate. He shall be paid from the county treasury for his services the sum of two dollars for each applicant so examined.

Section 2722-n. *Application for Relief—How Made.* All persons claiming the benefit provided herein may go before the County Clerk of their respective counties, and make affidavit to the facts which bring

him or her within the provisions of this act, which shall be deemed an application for said benefit; two citizens, residents of the county, shall be required to make affidavits to the fact that they have known said applicant to be a resident of the state for five years and the county for the one year immediately preceding the filing of said application; the County Clerk shall bring the same to the attention of the County Board of Supervisors, who shall refer the application to the Examiner of the Blind for said county.

Section 2722-o. *Duty of Clerk.* The County Clerk shall register the name, address and number of applicant, and date of the examination of each of the applicants who has been so determined to be entitled to said benefit, and each year, on or before the fifteenth day of January, he shall certify to the County Board of Supervisors the names and residences of each applicant.

Section 2722-p. *Duty of Board of Supervisors.* It is hereby made the duty of the County Board of Supervisors of each county in this state to cause warrants on the County Treasurer to be drawn, properly endorsed, payable to each of said persons in said county each quarter in each year thereafter, during the life of said persons, while they are residents of said county or until said disability is removed.

IOWA.

1913.

(Abstract taken from the last United States Census.)

Census of the Blind.

The County Assessors record the names, ages, sex and addresses of the blind in their jurisdiction and return the records to the Board of Education.

KANSAS.

1917.

Be it enacted by the Legislature of the State of Kansas:

Section 1. That whenever a blind person who has been an actual resident of the state for five years next preceding, and a pupil in actual attendance at a college, university, technical or professional school located in this state, and authorized by law to grant degrees, other than an institution established for the regular instruction of the blind, who shall be designated by the Board of Administration as a fit person to receive, and as one who ought to receive, the aid hereinafter provided for, it shall employ persons to read to such pupils from textbooks and pamphlets used by such pupil in his or her studies at such college, university or school; provided, that the Board of Administration shall not expend for this purpose for the use of any one such pupil to exceed \$300 per annum.

Section 2. That the Board of Administration is hereby authorized and empowered to select such persons as are entitled to the benefits of this act in the several colleges, universities or schools; provided that the Board of Administration shall not furnish a reader to any blind person who is not regularly matriculated, who is not in good and regular standing, who is not working for a degree from the institution in which he or she is matriculated, and who is not doing the work regularly prescribed by the institution for the degree for which he or

she is a candidate; and after making such selection the Board of Administration is authorized to name and designate some suitable and capable person to read to such blind pupil from textbooks and pamphlets used by him or her in studies in such college, university or school, and to fix the pay to be received by such reader for such services; provided, that no reader shall receive for his services to exceed the sum of \$300 in any one year.

Section 3. That there is hereby appropriated from any money in the treasury not otherwise appropriated for the purposes hereinbefore indicated, for the fiscal year ending June 30, 1916, \$750, and for the fiscal year ending June 30, 1917, \$750.

Be it enacted by the Legislature of the State of Kansas:

Section 1. That Section 1 of Chapter 149 of the Session Laws of the State of Kansas of 1913 be amended so as to read as follows: Sec. 1. That the Board of County Commissioners of any county in the State of Kansas is hereby authorized and empowered in their discretion and by unanimous vote, to pay a monthly pension, not to exceed fifty dollars per month, to any person over the age of twenty-one years who has lost both hands or both feet, or both eyes, or otherwise wholly disabled from performing any manual labor, and whose parents or near relatives are not financially capable of caring for them, provided such person has been a resident of the State of Kansas for ten years, and of the county wherein such pension is applied for two years previous to the date of application for pension, or was an actual resident of the state at the time such person became disabled.

KANSAS.

(Abstract taken from the last United States Census.)

School for the Blind.

The State Board of Administration has charge of the management and control of the Kansas School for the Blind. In all cases where the friends of any blind pupil in the state either neglect or are unable to supply the pupil with clothing and sufficient funds to enable him to attend the school for the blind, the overseer of the poor in the township in which he resides must investigate the case. Upon approval by the overseer, the county of the blind pupil's residence must provide him with clothing and necessary traveling expenses to and from the school, but such expenses must not exceed \$50, in addition to the actual traveling expenses for any pupil. Non-residents are not admitted into the school unless the Board of Administration orders their admission because their legal residence can not be ascertained or there are other peculiar circumstances that constitute a sufficient reason for the suspension of the rule. (Laws 1913.)

Compulsory Education.

Every parent, guardian, corporation, association or person having control of a blind person between the ages of 7 and 21 years must send such person to some suitable school where the blind are educated. The truant officer enforces this provision and a penalty is provided for failure to comply with it. (1909.)

Census of the Blind.

The assessors of the respective townships must take an annual census of the blind, which includes their age, sex and color, and names and addresses of their parents and guardians. The census is taken together with one of manufactures, agriculture, the deaf and dumb, insane and idiotic. (1909.)

KENTUCKY

1912

Article V.

Kentucky Institution for the Education of the Blind.

Section 299. *Corporate Powers Of.* That the school heretofore established and known as the "Kentucky Institution for the Education of the Blind," located within the City of Louisville, shall be and continue as a corporation in that name and style, with power and right to sue and be sued, plead and be impleaded, in any and all Courts of Justice in the United States of America, or elsewhere, in all cases in which the right or interest of said institution is involved; and said institution may receive, take or hold real or personal estate, by gift, devise or purchase, and dispose of the same for the use and benefit of said institution and may have a common seal, or act without a corporate seal.

Sec. 300. *Visitors—Board Of—Appointment How Filled—Oath.* That said institution shall be under the control, direction and management of nine citizens of Jefferson County as visitors, who shall hold their office for four years, and until their successors are appointed and qualified. The said visitors shall be nominated by the Governor and approved by the Senate; and in case of any vacancy in the board of visitors by death, resignation, removal from the County of Jefferson, or any other cause, the Governor shall be informed of such vacancy by the president or secretary of the board of visitors, and the Governor shall appoint some competent person to supply or fill the vacancy for the remainder of the term of the office of the visitor who may cease to be a member of said board; and such appointment shall be reported by the Governor to the Senate at the next meeting of the General Assembly after such appointment, for confirmation. Should the Senate reject any nomination made by the Governor, under this act, he may make other nominations to the Senate, so that said board of visitors shall be full at all times. The said visitors shall be commissioned by the Governor, and shall take the oaths of office required by the Constitution of this State, and to "well and truly discharge the duties of the office of visitor as required by this act." The Governor shall appoint said board of visitors as soon as this act becomes a law.

Sec. 301. *Powers and Duty of Board—Admission of Pupils—Superintendent—Treasurer.* That the board of visitors, or majority, shall appoint from their own body a president at their first meeting, who shall preside at the meeting of said board, and do and perform other duties required of him by the by-laws, rules or regulations, or orders of said board; and said board shall appoint a secretary to keep a regular record of their proceedings, and to perform any other duties the board may require of him. The said board of visitors may receive, by legacy or otherwise, money, land and other property, and use, retain and apply

the same to the use and benefit of said institution. The board of visitors shall have the possession, preservation, repairs and control of the building and ground belonging to this State, dedicated to the education of the blind in the City of Louisville. And said board of visitors shall have the direction, control and management of the special and general matters, concerns and interest of said property and institution, may employ a superintendent, a physician, matron, professors, teachers, servants and all other necessary agents and employes, and fix their pay or compensation for their services; prescribe and direct their duties and conduct; remove at their pleasure any superintendent, matron, professor, teacher, servant, agent or employe, and prescribe the course of education for the pupils in said institution and rules for their government and discipline, and fix and regulate tuition fees and terms of admission of pupils into said institution from other States; but no charge shall be made for the admission of pupils from this State. The said board of visitors shall have power to pass such by-laws, rules and regulations, resolutions, orders, instructions, as a majority of said board shall consider fit and proper to carry into effect and force the powers herein granted, and may repeal, amend or annul any such acts or proceedings and adopt others to effectuate the objects of the said institution. The said board of visitors shall meet at least once in each month of each year, at any place in the City of Louisville, and may meet oftener, if necessary, to transact the business committed to their charge; and the president or any two members of the said board may call a meeting of the board. In the absence of the president, the board may elect a president pro tem., and may supply the place of a secretary, when he is absent, in the same manner.

The said board of visitors shall require from the superintendent, annually, a full and detailed statement of the condition of said institution, the name of each employe, including matron, professors, teachers, servants and agents; the pay or salary of each, annually or monthly; the number and names of pupils, the residence of each, the number of pay pupils, the amount paid by them, and a full account and statement of the receipts from all sources and expenditures and outlays of the institution in the preceding year; and may require from the superintendent any other information or facts within the duties prescribed by the board of visitors to him. The said board of visitors shall elect a treasurer for said institution, who shall, before he enters upon the duties of his office, execute bond, with good security, to be approved by the Governor of this State, payable to the Commonwealth of Kentucky in the penal sum of twenty thousand dollars, conditioned well and truly to discharge the duties of the office of treasurer of the "Kentucky Institution for the Blind," and pay over and account for all money, and to account for and deliver all property or evidence of debt or of value placed in his hands or possession as treasurer of said institution, on the order of the board of visitors, which bond may be enforced and recovery had on a breach thereof by motion or action at law, as in case of official bonds of sheriffs within the Commonwealth, and shall be delivered to the Auditor of Public Accounts for safe keeping.

Sec. 302. *Institution to Remain Under Legislative Control.* That said institution and its control, direction, management, property, means

and officers and employes shall be, and remain at all times, subject to the control and pleasure of the General Assembly of this Commonwealth; and the Governor shall have a supervisory power and right of visitation over the same.

Sec. 303. *Treasurer—Payment of Claims—Record to Be Kept.* That the treasurer of said institution shall only pay the debts, claims and charges against said institution, on warrants of the president, after they have been examined, audited and approved by said board of visitors, at a meeting of the majority of the members thereof, which examination and approval shall be certified by the president of said board and countersigned by the secretary; and each claim shall be noted or named on the journal of the proceedings of said board, giving the date, amount and name of the person to whom allowed. The said treasurer shall annually, in the month of November, settle with the Auditor of Public Accounts for the receipts and disbursements during the preceding year, and shall file with the Auditor a statement of said accounts and the vouchers for the same; and the Auditor shall furnish and deliver to said treasurer a written statement, signed by the Auditor; and said treasurer shall furnish to the said board of visitors an annual written statement of his account immediately after settling the same with the Auditor. The statement of the Auditor shall be a sufficient voucher to the Treasurer.

Sec. 304. *Report of Condition of Institution to Be Made Annually.* That the board of visitors shall annually report to the Governor, for the purpose of being laid before the General Assembly, a general statement of the condition of said institution accompanied with the statements required to be furnished to said board by the superintendent and treasurer, so that the Legislature may be informed of all matters connected with said school and its wants, prospects and benefits. The treasurer may be removed from office at the pleasure of a majority of the members of the board of visitors and another elected to supply the vacancy; and the vacancy in the office of the treasurer may be filled by said board at any time.

Sec. 305. *Pupils—Expulsion and Punishment.* That the board of visitors shall alone have the power to expel a pupil from said institution and no officer of said institution, or employe thereof, shall be permitted to inflict corporal punishment upon any of said pupils.

Sec. 306. *Appropriation Heretofore Made to Continue.* That to enable said board of visitors to defray and pay the expenses of said institution, and provide the necessary supplies of food, clothing and other proper and necessary things, the annual appropriation heretofore made for said institution shall be continued to be drawn as heretofore authorized by the law.

Sec. 307. *Pupils—Term of Meritorious May Be Extended.* That the board of trustees of the Kentucky Institution for the Education of the Blind are hereby authorized to extend, at their discretion, the school term of such meritorious pupils as are worthy of larger instruction in literature, music and mechanical arts.

Sec. 308. *Appropriation Allowed for Each Pupil.* That the annual allowance for the support and education of the State pupils in said in-

stitution be increased from and after the thirty-first day of March, 1856, to one hundred and forty dollars for each pupil.

Sec. 309. *Appropriation—Annual Fifteen Thousand Dollars.* That the annual appropriation for the support of said institution be, and hereby is, increased from six thousand to ten thousand dollars. (By Act of March 17, 1906, the annual appropriation was increased from ten thousand to fifteen thousand dollars.)

Sec. 310. *Appropriation—Annual for Colored Children.* That the further sum of three thousand dollars be, and the same is hereby, appropriated, to be paid annually in equal quarterly installments, for the sole and exclusive use of the colored blind children of this Commonwealth, which money shall be expended in a similar manner and under the same limitations that the money appropriated for the use of the white blind children in said institution is now expended; provided, however, that no portion of the sums hereby appropriated shall be paid until the building aforesaid is completed and paid for, and ready for the use and occupation of the colored blind children of this Commonwealth, and of this fact the Auditor of Public Accounts is first duly certified in writing by the president and secretary of the board of visitors of the Kentucky Institution for the Education of the Blind.

Sec. 311. *Colored Children—Provisions for Education.* That the blind children aforesaid, when such buildings shall have been erected, shall be entitled to receive on equal terms their due proportion, according to numbers, of rights, benefits, and privileges secured to the white blind children of this Commonwealth by the act establishing the Kentucky Institution for the Education of the Blind; provided, however, that the blind children of both races shall be under the same general management and under one and the same superintendent, who, with all other officers of said institution, shall be elected by, and subject in all respects to the supervision and control of, the board of trustees of said institution as heretofore provided by the law.

An Act for the benefit of the Kentucky Institution for the Education of the Blind.

An Act for the benefit of the Kentucky Institution for the Education of the Blind by making an appropriation therefor and providing for the periods of payment.

Be it enacted by the General Assembly of the Commonwealth of Kentucky:

1. That the annual appropriation to the Kentucky Institution for the Education of the Blind be and the same is hereby increased from \$15,000 to \$20,000 annually.

2. That the Auditor is hereby authorized and directed to draw his warrant in favor of the treasurer of the Kentucky Institution for the Education of the Blind quarterly upon the treasurer of the Commonwealth in advance, to-wit: that a warrant for the first two quarters of the year 1912 shall be issued for \$10,000 on April 1, 1912, and subsequently a warrant on the 1st day of July for \$5,000 and on the 1st day of October for \$5,000 and on the 1st day of the following January for \$5,000 and so thereafter for the succeeding quarters, a warrant for \$5,000.

3. All acts or parts of acts in conflict herewith are hereby repealed.

4. An emergency is hereby declared to exist and this act shall become effective on and after its passage and approval at the hands of the Governor.

(Approved by the Governor, March 12, 1912.)

The above is a true copy of the act for the benefit of the Kentucky Institution for the Education of the Blind.

June 10-12.

Attested. Frank K. Kavanaugh.

AN ACT to amend an act entitled "An Act to Incorporate the Kentucky Institution for the Education of the Blind, and to Provide for the Regulation Thereof: (1914)

Be it enacted by the General Assembly of the Commonwealth of Kentucky:

1. That Section 300 of the Kentucky Statutes, which is in the following words and figures, to-wit:

"300. *Visitors—Board of—Appointment, How Filled—Oath.* That said institution shall be under the control, direction and management of nine citizens of Jefferson County as visitors, who shall hold their office for four years and until their successors are appointed and qualified. The said visitors shall be nominated by the Governor and approved by the Senate; and in case of any vacancy in the board of visitors, by death, resignation, removal from the County of Jefferson, or any other cause, the Governor shall be informed of such vacancy by the president or secretary of the board of visitors and the Governor shall appoint some competent person to supply or fill the vacancy for the remainder of the term of the office of the visitor who may cease to be a member of said board, and such appointment shall be reported by the Governor to the Senate, at the next meeting of the General Assembly after such appointment, for confirmation. Should the Senate reject any nomination made by the Governor, under this act, he may make other nominations to the Senate, so that said board of visitors shall be full at all times. The said visitor shall be commissioned by the Governor, and shall take the oaths of office required by the Constitution of this State, and to well and truly discharge the duties of the office of visitor as required by this act. The Governor shall appoint said board of visitors as soon as this act becomes a law,"

Be amended to read as follows:

"That said institution shall be under the control, direction and management of five citizens of Jefferson County, as visitors, who shall hold their office for four years, or until their successors are appointed and qualified. The said visitors shall be nominated by the Governor and approved by the Senate; in case of any vacancy in the board of visitors by death, resignation, removal from the County of Jefferson or any other cause, the Governor shall be informed of such vacancy by the president or secretary of the board of visitors and the Governor shall appoint some competent person to supply or fill the vacancy for the remainder of the term of the office of the visitor who may cease to be a member of said board; and such appointment shall be reported by the Governor to the Senate at the next meeting of the General Assembly after such appointment, for confirmation. Said visitors shall be commissioned by the Governor and shall take the oath of office required by the Constitution of this State and to well and truly discharge the

duties of the office of visitor as required by this act.' The Governor shall appoint said board of visitors of five as soon as this act becomes a law."

2. The superintendent of the institution shall at all times be a person with experience and training in the education of the blind, and no person who shall not have had at least five years experience in the education and training of the blind shall be appointed superintendent of said institution.

3. For cause at any time, the Governor of the State shall have the right to remove any trustee from office as such visitor, and appoint a successor to such person so removed and shall report the facts concerning such removal and such appointment to the next General Assembly.

LOUISIANA

(Abstract taken from the last United States Census.)

School for the Blind.

1915

The Louisiana State School for the Blind at Baton Rouge is governed by a board of trustees composed of seven resident citizens of the State and the Governor, who is ex officio president of the board. The members are appointed by the Governor for terms of four years and serve without pay other than the expenses of their meetings, which must be held at least once every four months. The institution provides, according to the law, all the requisite facilities for acquiring a good literary education, and an industrial department, in which instruction is given in such trades as are best suited to render the pupils self-sustaining citizens.

All residents between the ages of 7 and 22 years, blind, or of such defective vision as not to be able to acquire an education in the ordinary schools, are admitted to the State institution if they are of sound mind and body.* Such persons receive instruction, board, lodging and medicine and medical attendance at the expense of the State, and if in such indigent circumstances as to render it necessary, are also furnished with clothing and traveling expenses to and from the institution. Persons admitted as pupils under 14 years of age may continue in the institution ten years; if over 14 and under 17 years of age, they may continue eight years; and if over 17 years of age, they may continue five years. The board may in any case extend the term two years.

Census of the Blind.

1908.

The assessors of the parishes must make an enumeration of the names, ages, and sex of all blind children between the ages of 6 and 18 years, in their respective parishes, and furnish to the State board of education one of these lists.

MAINE

1913

Chapter 46, Sec. 116. Upon the request of the parents or guardians, the Governor may, with the approval of the council, send such blind

*According to the superintendent of the Louisiana State School for the Blind, only white pupils are admitted to the school.

children as he may deem fit subjects for education, for a term not exceeding ten years, and thereafter in the discretion of the Governor and council, in the case of any pupil, to the Perkins Institute for the Blind at South Boston, Massachusetts, provided, however, that when the authorities in charge of said Perkins Institute for the Blind shall refuse for any reason to admit such blind children to said institute then the Governor may, with the approval of the council, send such children so refused to any institution for the blind wherever located. In the exercise of the discretionary power conferred by this section, no distinction shall be made on account of the wealth or poverty of the parents or guardians of such children. No such pupils shall be withdrawn from such institution except with the consent of the proper authorities thereof or of the Governor; and the sums necessary for the support and instruction of such pupils in such institution, including all traveling expenses of such pupils attending such institution shall be paid by the state; provided, however, that nothing herein contained shall be held to prevent the voluntary payment of the whole or any part of such sums by the parents or guardians of such pupils.

MAINE

Relief for the Needy Blind.

1915

All persons over the age of 21 years who are declared to be blind in the manner provided by law, and who come within the provisions of the law, may, at the discretion of the Governor and council, receive as a benefit \$200 a year, payable quarterly upon warrants drawn on the State treasurer.

No one who is in charge of any charitable or penal institution of the State, or of any charitable or penal institution of any country or city of the State, or who has an income of more than \$300 a year, or who is able to earn the same, or who has not resided within the State continuously for ten consecutive years, and in his county for one year immediately before applying for the benefit, is entitled to it.

Persons claiming the benefit may go before the city, town or plantation clerk where they reside and make affidavits to the facts which bring them within these provisions, and the affidavit will be considered an application for the benefit. The city, town or plantation clerk must transmit the affidavit, together with the affidavit of two witnesses, residents of the same county, as to the place and time of residences of the applicants, to the municipal officers of the city, town or plantation where the blind persons reside. There must be appointed by the municipal officers of the cities, towns and plantations of the State a regular practicing physician whose official title is examiner of the blind, who must have an office in some convenient place in the city, town or plantation during the first weeks of June and December of each year for the examination of applicants. All applications are forwarded to the examiners, who must make a record of them, and endorse on them whether or not the persons are blind and needy; for this they receive a fee of \$2 for each application, from the county treasury. The name and residence of all applicants entitled to the benefits are certified to the Governor and council twice each year by the municipal officers, and it is made the duty of the Governor and council to cause \$50 to be paid to

such persons every three months during the life of the person while he is a resident of the State, or until the disability is removed.

Any person making a false affidavit in order to secure this benefit is, upon conviction, deemed guilty of perjury, and is subject to the penalty provided by law for such cases.

Exemption of the Blind.

1907

The blind are specially exempted from paying poll taxes, and from the penalties of the laws applying to tramps.

MAINE

(Abstract taken from the last United States Census.)

Education of the Blind.

1913

The Governor, with the approval of the council, and upon request of the parent or guardian, may send any blind child, whom he may think a fit subject for education, as a State beneficiary to the Perkins Institute for the Blind at South Boston, Mass., for a period not to exceed ten years. In the discretion of the Governor and Council this period may be extended. If for any reason the child is refused admittance to the Perkins Institute, the Governor and council may send the child so refused to any other blind institution. No child, so sent, may be withdrawn from any institution without the consent of the authorities of the institution or of the Governor. In the choice of such a State beneficiary no distinction may be made on account of the wealth or poverty of the parents or guardians of the child. The State pays for his support and instruction, and his traveling expenses to and from any institution to which he is sent. The parent or guardian of any such child is not prevented from voluntarily paying the whole or part of the expenses.

1907

The State makes an annual appropriation for the Maine Institution for the Blind, a private institution. The original appropriation in 1907 provides that blind or partially blind residents of the State over 18 years of age shall receive practical instruction for a period not exceeding three years, in some useful occupation conducive to their self-support. Temporary support may be provided for any workmen or pupils and means may be devised to facilitate the circulation of books, to promote visits among the aged or helpless blind in their homes, and to help them in other ways; but the permanent maintenance of any blind person at the expense of the State is forbidden.

MARYLAND

An Act to incorporate the Maryland Institution for the Instruction of the Blind.

Passed May 19th, 1853.

Section 1. Be it enacted by the General Assembly of Maryland, That J. Smith Hollins, Jacob I. Cohen, Jr., John N. McJilton, John Glenn, William George Baker and Benjamin F. Newcomer, and such other persons as shall become members of the Institution hereby created, and their successors, be, and they are hereby created a corporation, by the name of the Maryland Institution for the Instruction of the Blind, and

by that name may sue and be sued, answer and defend in any court of law or equity, and may ordain and establish such by-laws, rules and regulations as shall appear necessary or proper for conducting the concerns of said corporation, and shall not be contrary to law, and the same to alter and renew at pleasure, and may have and use, and at pleasure change, a common seal, and generally may do any act or thing necessary or proper to carry into effect the provisions of this act and to promote the design of the corporation.

Sec. 2. And be it further enacted, That the object of said corporation shall be the instruction of the blind.

Sec. 3. And be it further enacted, That the said corporation shall have the power of receiving donations, subscriptions, devises and legacies of real or personal estate and money, and to purchase and hold real and personal property, in trust or otherwise, for the promotion of the objects of the corporation.

Sec. 4. And be it further enacted, That the Board of Directors shall consist of nine persons, who shall be elected annually by the corporate members of said institution, on the first Monday of January; but in case no election shall then take place, the directors then in office shall continue to hold over until a new election shall take place; provided, however, that the nine persons above named be and they are hereby constituted the Directors of the Institution, to serve until the first annual election.

Sec. 5. And be it further enacted, That in case of death, resignation or removal from the State of any of said Directors, the remaining Directors shall have the power of filling such vacancies, until a new election of the others shall be held by the corporation.

Sec. 6. And be it further enacted, That nothing in this Act contained shall be so construed as to authorize said corporation to issue any note, token or other evidence of debt, to be used as currency; and the Legislature hereby reserves to itself the right to alter, amend or repeal this Act at pleasure.

Sec. 7. And be it further enacted, That this Act shall take effect from the date of its passage.

MARYLAND

Amendments to Charter.

Act 1854. Chapter 67.

An Act to amend the charter of the Maryland Institution for the Instruction of the Blind, passed at January session, 1853.

Sec. 1. Be it enacted by the General Assembly of Maryland, That the Maryland Institution for the Instruction of the Blind is hereby authorized to increase its Board of Directors to a number not exceeding eighteen persons.

Sec. 2. And be it enacted, That the present Board of Directors shall have the power of electing additional members of the board to serve until the next general election.

Sec. 3. And be it enacted. That the Board of Directors be invested with the same powers and elected in the same manner as originally provided for in the charter.

Sec. 4. And be it enacted, That this act shall take effect from the date of its passage.

Act 1886. Chapter 481. Page 796.

Section 1. Be it enacted by the General Assembly of Maryland, That Section 1 of an Act passed at January session, 1853, Chapter 203, entitled "An Act to incorporate the Maryland Institution for the Instruction of the Blind," be and the same is hereby amended by changing the name of said corporation from the Maryland Institution for the Instruction of the Blind to "The Maryland School for the Blind."

Amendments to Code.

Acts 1892. Chapter 272. Page 377.

Section 1. Be it enacted by the General Assembly of Maryland, That Section 3 of this Article XXX of the Code of Public General Laws of Maryland, title "Deaf, Dumb and Blind, Education of," be and the same is hereby repealed and re-enacted so as to read as follows:

Section 3. A sum not exceeding \$21,000 shall be annually appropriated to be applied under the direction of the Governor, in placing for instruction in the Maryland School for the Blind, formerly known as the Maryland Institution for the Instruction of the Blind, such indigent blind persons of the age of seven years and upwards, inhabitants of the State, and of the county or city from which they are recommended, as may be recommended to the Governor by the county commissioners of each county, or by the judges of the Orphans' Court of Baltimore City.

MARYLAND

Compulsory Education Law: Laws of Maryland, 1906.

Ch. 236, p. 356.

An Act to amend Article 77 of the Code of Public General Laws, title "Public Education," by repealing and re-enacting Chapter 299 of the laws of 1904, which added to said Article, Section 139, 140 and 141, under the sub-title "School Attendance," and by adding a new section to be numbered as Section 142.

Section 1. Be it enacted by the General Assembly of Maryland, That the Sections 139, 140 and 141, of Article 77 of the Code of General Laws, title "Public Education," under the sub-title "School Attendance," are hereby repealed and re-enacted as follows, and that a new section be added to follow Section 141, to be numbered and designated as Section 142.

139. Every deaf or blind child between six and sixteen years of age shall attend some school for the deaf or blind for eight months, or during the scholastic years, unless it can be shown that the child is elsewhere receiving regularly thorough instruction during the said period, in studies usually taught in the said public schools to children of the same age; provided, that the superintendent or principal of any school for the deaf or blind, or person or persons duly authorized by such superintendent or principal, may excuse cases of necessary absence among its enrolled pupils; and provided further, that the provisions of this section shall not apply to a child whose physical condition is such as to render its instruction, as above described, inexpedient or impracticable. Every person having under his or her control a child between

six and sixteen years of age shall cause such child to attend school or receive instruction as required by this section.

139a. Provided that where the parent, guardian or any other person having control of a deaf or blind child is not financially able to pay for the transportation of the child to and from such school, the same shall be paid out of the State appropriation for the school which the child attends; provided, that three reputable male citizens over the age of twenty-one years, residents of the school district in which the said child resides, shall certify under oath that to the best of their knowledge and belief, the parent, guardian or other person having control of such child is not financially able to pay the expense of the child to and from school.

140. Any person who has such a child under his or her control, and who fails to comply with any of the provisions of the preceding section, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, before a justice of the peace, be fined a sum not exceeding five dollars for each offense.

141. Any person who induces or attempts to induce any deaf or blind child to absent himself or herself unlawfully from school or employs or harbors any such child absent unlawfully from school, while said school is in session, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof before a justice of peace, be fined a sum not exceeding fifty dollars for each offense.

142. The principal teacher of every public school in the counties and the truant officers of the city of Baltimore shall, within thirty days from the beginning of the school year succeeding the passage of this act, furnish the Board of County School Commissioners or the Board of Education of Baltimore City, as the case may be, with the names of all children who are deaf, blind or feeble-minded, between the ages of six and sixteen years, inclusive, living within the boundaries of his or her school district who do not attend school. And the Board of County School Commissioners or Board of Education of Baltimore City shall certify forthwith the names of all such deaf, blind or feeble-minded children to the respective principals of the State schools for such children.

Sec. 2. And be it enacted, That this Act shall take effect from the date of this passage.

Approved March 31, 1906.

MARYLAND

Appendix—Laws of Maryland, 1906.

Chapter 290.

A bill entitled an act to provide for the appointment of a commission to investigate the condition of the Adult Blind in the State of Maryland, and to report on the expediency of the establishment by the State of institutions for them, and making an appropriation for the necessary expenses of said commission and assistance for certain classes of blind people pending said report.

Section 1. Be it enacted by the General Assembly of Maryland, That within sixty days after the passage of this Act the Governor shall appoint a commission of five persons, who shall serve without pay, and who shall be known as "The Commission for Improving the Condition of the Adult Blind in the State of Maryland."

Sec. 2. And be it enacted, That it shall be the duty of this Commission to secure a complete list of all blind persons in the State of Maryland, and make a record of their names, ages and financial condition, together with the cause and extent of their blindness, their capacity for educational and industrial training, and such other facts as may seem of value; and that on or before the 1st day of December, 1907, they shall file with the Governor a full report of their findings, together with such recommendations for improving the condition of the adult blind in this State as may seem to them advisable.

Sec. 3. And be it enacted, That the commission may aid those adult blind whom they consider worthy in finding employment, and in furtherance thereof they may furnish material and tools to an amount not exceeding \$50 to any one individual, and they may place in a home or homes such indigent blind as appear to them worthy women and to have no other means of support; provided, however, that the total expenditure on any such woman shall not exceed two hundred dollars per annum.

Sec. 4. And be it enacted by the General Assembly of Maryland, That the sum of \$1,500 annually, for the fiscal year of 1907 and 1908 be and the same is hereby appropriated, to be paid out of any money in the treasury not otherwise appropriated.

Approved April 6, 1906.

LAWS OF MARYLAND, 1908.

Page 98, Art. 30, Chap. 566.

An Act to establish a workshop for the employment of blind men and women and making an appropriation therefor.

Section 1. Be it enacted by the General Assembly of Maryland, That there shall be maintained in Baltimore City, Maryland, a Workshop for the Blind.

Sec. 2. And be it enacted, That the general supervision and control of said workshop shall be vested in a board of five trustees, three of whom shall be appointed by the Governor, by and with the advice of the Senate, and two shall be elected by the Board of Directors of the Maryland School for the Blind; and the term of the members of said board shall be for a period of two years from the date of their appointment or until their successors shall have been appointed and qualified. And whenever a vacancy shall occur on said board it shall be filled for the unexpired term by vote of the said members of the board remaining.

Sec. 3. And be it enacted, That said Board of Trustees shall constitute a body corporate under the name and style of "The Maryland Workshop for the Blind," with the right to acquire and hold property, real, personal and mixed in any manner whatsoever; to sue and be sued; and to make and use a common seal with the right to alter and change the same at any time. The board shall organize immediately upon its appointment and qualification and elect one of its members chairman and another as treasurer. It shall also have the power to elect any of its members to serve as chairman whenever it is inconvenient or impossible for the regularly elected chairman to serve. It is also empowered to hire a secretary and other necessary employees, and to fix their compensation.

Said workshop shall be open for the labor and manufactures to all blind citizens of Maryland over 18 years of age who can give satisfactory evidence of character and of their ability to do the work required of them. All the profits arising from the operation of the shop shall be used in furthering its usefulness.

Sec. 4. And be it enacted, That said board shall acquire suitable quarters by lease, purchase or otherwise in Baltimore City aforesaid, and shall have full power to establish, maintain and direct and supervise all matters pertaining to the workshop, its maintenance and regulation, including the purchase of all machinery and materials as may seem to them suitable and necessary, and the barter or exchange of articles or manufactures entrusted to them for disposal.

Sec. 5. And be it enacted by the General Assembly of Maryland, That the sum of five thousand dollars annually for the fiscal years 1909 and 1910 be, and the same is hereby appropriated to be paid out of any money in the treasury not otherwise appropriated.

Approved April 8, 1908.

Also: Laws of Maryland, 1910, Chapter 409, Section 95.

Laws of Maryland, 1912, Chapter 93, Section 74.

Appropriating \$10,000 for the fiscal years 1911, 1912, 1913, 1914,

1911

Upon recommendation by the county commissioners or the judge of the Orphans' Court of Baltimore City, the Governor may send any indigent blind person, resident of the State and of the county or city from which they are recommended, to the Maryland School for the Blind (a private institution, closely connected with the state, for the instruction of blind white and blind and deaf colored children). The state appropriates a sum of money not to exceed \$350 annually for each such blind persons.

MASSACHUSETTS.

1908.

Acts of 1899, Chapter 13.

Resolve Relative to the Instruction of the Adult Blind.

Resolved, That the State Board of Education is hereby directed to inquire into the feasibility of instructing the adult blind at their homes, and to report the result of its investigations, with such recommendations as it may deem proper, to the next general court.

Approved March 1, 1899.

Acts of 1900, Chapter 430.

An Act to provide for the instruction of the adult blind at their homes by the Perkins Institution and Massachusetts School for the Blind.

Be it enacted, etc., as follows:

Section 1. There shall be allowed and paid out of the treasury of the commonwealth a sum not exceeding one thousand dollars, to be expended by the Perkins Institution and Massachusetts School for the Blind, for the instruction of the adult blind at their homes; but no expenditures shall be made under this act until the plans for such instruction have received the approval of the State Board of Education.

It shall be the duty of the institution aforesaid to make a report to the State Board of Education of its doings under this act.

Sec. 2. This act shall take effect upon its passage.

Approved July 5, 1900.

Acts of 1901, Chapter 98.

Resolve to provide for the instruction of the adult blind at their homes by the Perkins Institution and Massachusetts School for the Blind.

Resolved, That there be allowed and paid out of the treasury of the commonwealth a sum not exceeding thirty-six hundred dollars, in addition to the unexpended balance of the appropriation authorized by Chapter 430 of the acts of the year 1900, to be expended by the Perkins Institution and Massachusetts School for the Blind for the instruction of the adult blind at their homes. It shall be the duty of the said institution to make a detailed report to the State Board of Education of the expenditures under this resolve.

Approved June 10, 1901.

Acts of 1902, Chapter 297.

An Act to provide for the instruction of the adult blind at their homes by the Perkins Institution and Massachusetts School for the Blind.

Be it enacted, etc., as follows:

There shall annually be allowed and paid out of the treasury of the commonwealth a sum not exceeding five thousand dollars, to be expended by the Perkins Institution and Massachusetts School for the Blind for the instruction of the adult blind at their homes. It shall be the duty of the said institution to make a detailed report each year to the State Board of Education of the expenditures under this act.

Approved April 11, 1902.

Acts of 1903, Chapter 27.

An Act making an appropriation for the instruction of the adult blind at their homes by the Perkins Institution and Massachusetts School for the Blind.

Be it enacted, etc., as follows:

Section 1. The sum of five thousand dollars is hereby appropriated, to be paid out of the treasury of the commonwealth from the ordinary revenue, to provide for the instruction of the adult blind at their homes by the Perkins Institution and Massachusetts School for the Blind, for the year ending on the 1st day of December, 1903.

Sec. 2. This act shall take effect upon its passage.

Approved January 31, 1903.

Acts of 1903, Chapter 74.

Resolve to provide for the appointment of a commission to investigate the condition of the adult blind.

Resolved, That the Governor, with the advice of the council, is hereby authorized and requested to appoint a commission consisting of three persons, one of whom he shall designate as chairman, which commission shall investigate the condition of the adult blind within this commonwealth, shall inquire into the means and methods whereby their condition may be ameliorated, shall consider the expediency of the establishment by the commonwealth of an industrial training school or other institution for the adult blind, and may recommend legislation. The

commission shall serve without compensation, but may employ such assistance as may be necessary, and its necessary expenses, including traveling expenses, so far as the same are approved by the Governor and council, shall be paid from time to time from the treasury of the commonwealth. The commission shall report the result of its investigations to the general court on or before the 15th day of January in the year Nineteen Hundred and Four. If the commission shall recommend legislation it shall accompany its report with drafts of such bills as may be necessary to carry its recommendations into effect.

Approved May 9, 1903.

Acts of 1904, Chapter 20.

An Act making an appropriation for the instruction of the adult blind at their homes by the Perkins Institution and Massachusetts School for the Blind.

Be it enacted, etc., as follows:

Section 1. The sum of five thousand dollars is hereby appropriated, to be paid out of the treasury of the commonwealth from the ordinary revenue, to provide for the instruction of the adult blind at their homes by the Perkins Institution and Massachusetts School for the Blind, for the year ending on the 31st day of December, Nineteen Hundred and Four.

Sec. 2. This act shall take effect upon its passage.

Approved January 30, 1904.

Acts of 1904, Chapter 87.

Resolve relative to the adult blind.

Resolved, That the Governor, with the advice of the council, is hereby authorized and requested to appoint a commission consisting of three persons, one of whom he shall designate as chairman, which commission shall prepare a complete register of the adult blind in the commonwealth between the ages of twenty and sixty years, containing a description of their condition, the cause of their blindness, and their capacity for industrial training. Adult blind persons between the ages of twenty and sixty years who desire to receive industrial training in schools for the blind in other states than Massachusetts may, on the recommendation of the commission and with the approval of the Governor and council, be sent to such school, and their expenses while receiving such training may be paid in whole or in part from the treasury of the commonwealth, with the approval of the Governor and council. The commission shall also investigate and report as to the advisability and feasibility of ameliorating the condition of the adult blind by industrial training, the establishment of industrial schools, or by any other means. The commission shall serve without compensation, but it may employ such assistance as may be necessary, and its necessary expenses, including traveling expenses, so far as the same are approved by the Governor and council, shall be paid from the treasury of the commonwealth. The commission shall report the result of its investigations to the general court on or before the 15th day of January, in the year Nineteen Hundred and Five, with such recommendations as it may deem advisable, and shall include in its report

the register of the adult blind to be prepared under the provisions of this resolve, a list of the names and ages of all adult blind persons placed in schools for the blind in other states under the authority of this resolve, a statement of the expense to the commonwealth incurred thereby, and, so far as is practicable, of the progress made by every such person in any such school. If the commission shall recommend legislation it shall accompany its report with the drafts of such bills as may be necessary to carry its recommendations into effect. The total expenditures authorized by this resolve shall not exceed the sum of five thousand dollars.

Approved May 23, 1904.

Acts of 1905, Chapter 26.

An Act making an appropriation for the instruction of the adult blind at their homes by the Perkins Institution and Massachusetts School for the Blind.

Be it enacted, etc., as follows:

Section 1. The sum of five thousand dollars is hereby appropriated to be paid out of the treasury of the commonwealth from the ordinary revenue, to provide for the instruction of the adult blind at their homes by the Perkins Institution and Massachusetts School for the Blind, for the year ending on the 31st day of December, Nineteen Hundred and Five.

Sec. 2. This act shall take effect upon its passage.

Approved February 2, 1905.

Acts of 1905, Chapter 1.

Resolve to extend the time within which report shall be made by the commission appointed to prepare a register of the adult blind and to investigate and report as to their industrial training.

Resolved, That the time within which the commission appointed to prepare a complete register of the adult blind and for other purposes, which was constituted by Chapter 87 of the Resolves of the Year Nineteen Hundred and Four, is required to report to the general court, is hereby extended until the 15th day of January in the year Nineteen Hundred and Six; and the chief of the Bureau of Statistics of Labor is hereby empowered and instructed to aid the commission in its preparation of a register of the adult blind by furnishing it, upon its request, with the names, addresses and such other facts concerning the adult blind as may be recorded by the enumerators in taking the decennial census in the year Nineteen Hundred and Five.

Approved January 16, 1905.

Acts of 1906, Chapter 383.

An Act Relative to Compulsory Education.

Be it enacted, etc., as follows:

Section 1 of Chapter 44 of the Revised Laws, as amended by Section 1 of Chapter 320 of the Acts of the Year Nineteen Hundred and Five, is hereby further amended by inserting after the word "dollars," in the thirty-third line, the words: *Provided, however*, that no physical or mental condition which is capable of correction, or which renders the child a fit subject for special instruction at public charge in institutions other than the public day schools, shall avail as a defense under

the provisions of this section unless it shall be made to appear that the defendant has employed all reasonable measures for the correction of the condition, or the suitable instruction of the child—so as to read as follows: Section 1. Every child between seven and fourteen years of age, and every child under sixteen years of age who cannot read at sight and write ligibly simple sentences in the English language, shall attend some public day school in the city or town in which he resides during the entire time the public day schools are in session, subject to such exceptions as to children, places of attendance and schools as are provided for in Section 3 of Chapter 42 and Sections 3, 5 and 6 of this chapter. The superintendent of schools or, if there is no superintendent of schools, the school committee, or teachers acting under authority of said superintendent or committee, may excuse cases of necessary absence. The attendance of a child upon a public day school shall not be required if he has attended for a like period of time a private school approved by the school committee of such city or town in accordance with the provisions of the following section, or if he has been otherwise instructed for a like period of time in the branches of learning required by law to be taught in the public schools, or if he has already acquired such branches of learning, or if his physical or mental condition is such as to render such attendance inexpedient or impracticable. Every person having under his control a child as described in this section shall cause him to attend school as herein required; and if he fails for five day sessions or ten half day sessions within any period of six months while under such control to cause such child, whose physical or mental condition is not such as to render his attendance at school harmful or impracticable, so to attend school, he shall, upon complaint by a truant officer and conviction thereof, be punished by a fine of not more than twenty dollars; *provided, however*, that no physical or mental condition which is capable of correction, or which renders the child a fit subject for special instruction at public charge in institutions other than the public day schools, shall avail as a defense under the provisions of this section unless it shall be made to appear that the defendant has employed all reasonable measures for the correction of the condition, or the suitable instruction of the child. Whoever induces or attempts to induce a child to absent himself from school, or employs or harbors a child who, while school is in session, is absent unlawfully from school shall be punished by a fine of not more than fifty dollars.

Approved May 11. 1906.

MASSACHUSETTS.

1908.

Acts of 1907, Chapter 173.

An Act Relative to the Massachusetts Commission for the Blind.

Be it enacted, etc., as follows:

Section 1. Chapter 385 of the Acts of the Year Nineteen Hundred and Six is hereby amended by adding after Section 8 the following new sections:

Section 9. There may be advanced to the chairman of said commission out of the treasury of the commonwealth annually, from the amount appropriated for the maintenance of its industries, such sum

as may be necessary, not exceeding five thousand dollars at any one time, to be used as a working capital for said industries. Said sum when drawn from the treasury of the commonwealth shall be deposited in a national bank or trust company to the credit of the chairman of the commission as such, who shall give a bond in such sum and with such sureties as the Governor and council may approve.

Section 10. The commission shall keep separate books of account for its industries, and may use all moneys received from the sale of any products made at its workshops or from the sale of products made under its supervision to which it has title, for the purpose of carrying on its said industries. The auditor of accounts shall at least once in each year, and oftener if he deems it advisable, examine the books, accounts and vouchers of the commission.

Section 2. This act shall take effect upon its passage.

Approved March 6, 1907.

Acts of 1907, Chapter 174.

An Act making appropriations for the Massachusetts Commission for the Blind.

Be it enacted, etc., as follows:

Section 1. The sums hereinafter mentioned are appropriated, to be paid out of the treasury of the commonwealth from the ordinary revenue, for the salaries and expenses of the Massachusetts Commission for the Blind, for the fiscal year ending on the 30th day of November, Nineteen Hundred and Seven, to-wit:

For the maintenance of industries under the control of said commission, a sum not exceeding fifteen thousand dollars.

For general administration, for information, industrial and educational aid, and such other expenses as may be found necessary by the commission to carry out the provisions of the act establishing the commission, a sum not exceeding twenty-five thousand dollars.

Sec. 2. This act shall take effect upon its passage.

Approved March 6, 1907.

MASSACHUSETTS.

1913.

Act Establishing a Commission for the Blind.

Acts of 1906, Chapter 385.

An Act to establish the Massachusetts Commission for the Blind.

Be it enacted, etc., as follows:

Section 1. There shall be a state board, to be known as the Massachusetts Commission for the Blind, consisting of five persons, to be appointed by the Governor, with the advice and consent of the council, within sixty days after the passage of this act, one member of which shall be appointed for a term of five years, one for a term of four years, one for a term of three years, one for a term of two years and one for a term of one year. At the expiration of the term of any member of the commission, a member for the term of five years shall be appointed. Any member of the commission may be removed by the Governor, with the consent of the council for such cause as he shall deem sufficient and shall assign in the order of removal.

Sec. 2. The commission shall be authorized to prepare and maintain

a register of the blind in Massachusetts, which shall describe their condition, cause of blindness and capacity for education and industrial training. The chief of the Bureau of Statistics of Labor is hereby directed to aid the commission by furnishing it from time to time, upon its request, with the names, addresses and such other facts concerning the blind as may be recorded by the enumerators in taking any decennial census.

Sec. 3. The commission shall act as a bureau of information and industrial aid, the object of which shall be to aid the blind in finding employment and to develop home industries for them. For this purpose the commission may furnish materials and tools to any blind person, and may assist such blind persons as are engaged in home industries in marketing their products.

Sec. 4. The commission may, with the approval of the Governor and council, establish, equip and maintain one or more schools for industrial training, and workshops for the employment of blind persons, may pay to employees suitable wages, and may devise means for the sale and distribution of the products of such schools and workshops.

Sec. 5. The commission may receive in the schools established by it pupils from other states, upon the payment of such fees as the commission shall determine, and may at its discretion contribute to the support of pupils from Massachusetts receiving instruction outside the commonwealth.

Sec. 6. The commission, in furtherance of the purpose of this act, may provide or pay for temporary lodgings and temporary support for workmen or pupils received at any industrial school or workshop established by it, and may ameliorate the condition of the blind by devising means to facilitate the circulation of books, by promoting visits among the aged or helpless blind in their homes, and by such other methods as it may deem expedient; provided, that the commission shall not undertake the permanent support or maintenance of any blind person.

Sec. 7. The commission, with the approval of the Governor and council, may appoint such officers and agents as may be necessary, and fix their compensation within the limits of the annual appropriation; but no person employed by the board shall be a member thereof. It shall make its own by-laws, and shall annually, on or before the third Wednesday in January, make a report to the Governor and council of its doings up to and including the 30th day of November preceding embodying therein a properly classified and tabulated statement of its estimates for the year ensuing, with its opinion as to the necessity or expediency of appropriations in accordance with such estimates. The annual report shall also present a concise review of the work of the commission for the preceding year, with such suggestions and recommendations as to improving the condition of the blind as it may deem expedient. The members of the board shall receive no compensation for their services, but their traveling and other expenses necessary for the proper performance of their duties shall be allowed and paid out of the treasury of the commonwealth.

Sec. 8. There may be expended during the present year a sum not

exceeding twenty thousand dollars in carrying out the provisions of this act.

Sec. 9. This act shall take effect upon its passage.

Approved May 11, 1906.

MASSACHUSETTS.

Chapter 79, Acts and Resolves of 1914.

Resolve to Authorize the Massachusetts Commission for the Blind to Continue Its Investigation Into the Matter of Defective Eyesight.

Resolved, That there be allowed and paid out of the treasury of the commonwealth the sum of fifteen hundred dollars, to be expended by the Massachusetts Commission for the Blind for the salaries and expenses of those persons who are making a study of defective eyesight problems and doing the work of vocational guidance in individual cases, under the direction of the said commission.

Approved May 12, 1914.

MASSACHUSETTS.

1915.

Education of the Deaf and Blind.

Chapter 39.

Section 19. The Governor may, upon the request of the parents or guardians and with the approval of the board, send such deaf persons as he considers proper subjects for education, for a term not exceeding ten years, but, upon like request and with like approval, he may continue for a longer term the instruction of meritorious pupils recommended by the principal or other chief officer of the school of which they are members, to the American School, at Hartford, for the Deaf, in the State of Connecticut, to the Clarke School for the Deaf at Northampton, to the Horace Mann School at Boston, or to any other school for the deaf in the commonwealth, as the parents or guardians may prefer; and with the approval of the board he may, at the expense of the commonwealth, make such provision for the care and education of children who are both deaf and blind as he may deem expedient. No distinction shall be made on account of the wealth or poverty of such children or their parents. No such pupil shall be withdrawn from such institutions or schools except with the consent of the authorities thereof or of the Governor; and the expenses of the instruction and support of such pupils in such institutions or schools, including their necessary traveling expenses, whether daily or otherwise, shall be paid by the commonwealth; but the parents or guardians of such children may pay the whole or any part of such expense.

Sec. 20. The board shall direct and supervise the education of all such pupils, and shall state in its annual report the number of pupils so instructed, the cost of their instruction and support, the manner in which the money appropriated by the commonwealth therefor has been expended and such other information as it considers important.

Sec. 21. The board shall have the same supervision over the admission to, and instruction of pupils in, the Perkins Institution and Massachusetts School for the Blind as it now exercises over the instruction of the deaf under the provisions of the two preceding sections.

MICHIGAN.

1913.

Care of Blind Babies.

An Act to provide for the care, maintenance and instruction of blind babies and children under school age.

Te People of the State of Michigan enact:

Section 1. The State Board of Education shall have power to provide for the suitable care, maintenance and instruction of babies and children under school age residing in this state, who may be born blind or become blind in any case where by reason of lack of means or other cause the parent or parents of such children may be unable to properly care for, maintain and educate such children.

Sec. 2. For the purpose of providing such care, maintenance and education the said Board of Education shall have power to contract with any institution having or furnishing facilities for such care, maintenance and education in this or any other state at a contract price to be agreed upon, not exceeding five dollars per week per child; Provided, That such contract shall be made by and with the written consent of the parents or surviving parent of any such child.

Sec. 3. Such contract shall continue in force and the care, maintenance and education provided therein shall continue until such child attains the age of six years.

Sec. 4. There shall be included in the tax to be levied for state school purposes, a rate sufficient to raise the sum of twenty-five hundred dollars, in addition to all other sums provided by law, which sum, or so much thereof as may be necessary, is hereby appropriated for the purpose of carrying out the provisions of this act.

Sec. 5. Nothing in this act contained shall be deemed to repeal or in any way modify any existing law with reference to the education of the deaf, dumb, and blind.

This act is ordered to take immediate effect.

Approved May 7, 1913.

MICHIGAN.

1912.

(Abstract taken from the last United States Census.)

School for the Blind.

The general supervision and government of the Michigan School for the Blind is vested in the board of control of the Michigan School for the Blind, consisting of three members appointed by the Governor with the consent of the Senate. The members serve for terms of six years, without compensation other than their necessary expenses.

The school is to educate the blind and to afford them instruction in such useful arts and trades as they are best adapted to pursue and such as will best enable them to maintain themselves. All pupils received in the school are educated in the branches usually taught in the common schools, in vocal and instrumental music, and in such other branches of learning as the board prescribes. They also receive instruction in such mechanical trades as the board prescribes, and have proper physical and moral training.

All blind residents of the state or those whose defective sight pre-

vents their receiving instruction in the common schools, between the ages of 7 and 19 years, are received in the school without charge for tuition, board, lodging, washing, medicine, or medical attendance if in suitable condition of body and mind to receive instruction. The board may, in their discretion, admit persons under the age of 7 or over the age of 19 years. The board may admit applicants from other states and prescribe the compensation to be paid for them, but the compensation must be 10 per cent more than is sufficient to cover all their necessary expenses.

Pupils are entitled to remain in the school for 12 years, or in cases where the board thinks it advisable, 14 years. The board may, however, dismiss any pupil for sufficient cause at any time, or may arrange for the transfer of pupils over 18 years of age to the Michigan Employment Institution for the Blind.

The superintendent of the poor of the several counties of the state must send or cause to be sent to the school all persons entitled to admission to it who are a charge upon the respective counties or any township within them. The superintendent must, before sending any such persons, cause them to be decently and comfortably clothed, and must provide comfortable clothing while they remain at the school, defray their traveling expenses to and from the institution, provide them with such articles of necessity and convenience as are required by the rules of the school to be furnished by the pupils, and must also pay the board of such pupils during the usual annual vacation, if they are permitted to remain at the institution during the vacation. All persons entitled to admission to the school who are not a charge upon any county but who, on account of their poverty, are unable to furnish themselves with proper clothing and other articles required by the rules of the school, must be given the same aid from the superintendent of the poor of their respective counties while attending the school as specified above. When the parent, guardian or other person in charge of a child to be sent to the blind school on account of indigent circumstances is unable to furnish the traveling expenses necessary, the board of control of the blind school must furnish them and charge the same to their county of residence. Transportation to and from the school for the parent, guardian or other person in charge of a child under 12 years of age may be included with these expenses. In all cases where blind residents of the state are unable on account of poverty to furnish themselves with suitable clothing and other necessary expenses for attending school at the Michigan School for the Blind the board of control may render them assistance, not exceeding \$50 a year for each person. The amount is paid by the state and becomes a charge against the blind person's county of residence.

Compulsory Education.

Every parent or guardian or other person having control of any child between the ages of 7 and 19 years in the state who is blind or whose vision is so seriously defective as to make it impossible to have him properly educated in a school for the seeing, must send the child to the school for the blind, unless the child is being educated in a private or parochial school, or is physically or mentally incompetent of being educated, is over the age of 17 years and has been taught and is working

at a trade, or is 18 years of age and is employed at the Michigan Employment Institution for the Blind. The superintendent of the Michigan School for the Blind must furnish to each county commissioner of school, and to the secretary of the school board in every city or village, a list of the names of such children within the county, city or village, as come within the provisions of this law. Investigation of each case must then be made by the truant officer and a report rendered to the superintendent, who must determine the cases where steps are to be taken against the parents, guardians or other person having charge of such a child.

The Secretary of State must annually make out and forward to the superintendent of the school for the blind a copy in detail of so much of the statistical information received by him as relates to the blind. Each school census enumerator must procure the name, age, residence and the name and residence of the parents or guardians of each blind child, and of each child whose vision is so defective as to make it impossible properly to educate the child in the public schools, between the ages of 7 and 19 years. The enumerator must make a separate list of the data described above, and such lists must be forwarded by the secretaries of the school boards to the superintendent of public instruction, who must forward the results to the superintendent of the school for the blind.

Employment Institution for the Blind.

A board of three trustees, appointed by the Governor with the consent of the Senate for terms of six years, has general supervision and government of the Michigan Employment Institution for the Blind. One of the trustees must be a blind person; the Governor is ex officio a member of the board. The trustees receive no compensation other than their necessary expenses.

In the law establishing the institution the board was instructed to open and regulate an industrial or polytechnic school and factory, a working home and an employment and information bureau and circulating library for the benefit of adult blind persons of good moral character, together with such other departments as in their judgment may seem wise and judicious and best calculated to promote the objects and efficiency of the institution. The board must afford adult blind residents of the state, of good moral character, who are in suitable physical and mental condition for receiving instruction, and are in need of it, thorough instruction and training in such arts, trades, callings and branches of learning as will, in the opinion of the board, best serve to fit such persons to earn in whole or in part their own support. All expenses of maintenance of persons at the institution are paid by the state, but a charge not to exceed the amount paid out by the board on account of such beneficiaries, plus a reasonable charge for the use of the apparatus, etc., may be made upon persons applying for and willing to pay for the advantages afforded them. The term of instruction is at the discretion of the board, but is not to exceed three years for any individual learner.

All blind persons, residents of the state, between the ages of 18 and 60 years, who are of good moral character and in suitable condition of

body and mind to receive the instruction afforded or by their labor or services to earn the cost of their own support, must be received in the institution. Partially blind persons whose defective sight is such as to prevent them from successfully engaging in those common pursuits in which possession of vision is thought requisite to success may be admitted upon such just and reasonable terms as the board of trustees prescribes. The board may in its discretion admit persons between the ages of 14 and 18 years with the approval of the board of control of the Michigan School for the Blind, and may admit persons over 60 years of age.

In case of the unavoidable suspension of the industrial or manufacturing department of the institution, or of any trade or calling pursued in the institution, no charge may be made for the maintenance of those wage workers or blind employees whose opportunity of earning their own support is thereby interrupted, unless such suspension continues for a longer time than 14 weeks in any one year.

The board of trustees has power to dismiss any inmate or beneficiary of the institution whenever they think it advisable to do so on account of persistent disobedience, immoral conduct, or other sufficient cause, or in consequence of the person having accomplished the purpose for which he was admitted to the institution.

The provisions for the sending of persons to the Employment Institution for the Blind by the superintendent of the poor are similar to the provisions for the sending of persons to the school for the blind, except that the superintendents must pay for the board of such persons during any necessary suspension of their work, not exceeding 14 weeks for any individual during any one year, as well as during any vacation, if they are permitted to remain at the institution during those periods.

The various institutions of the state, under the control and management of state boards, are required to purchase, so far as the articles may be furnished promptly, from the employment institution for the blind such brooms and other articles made there as are required for their several uses, but at a price fixed by the managing officer of the employing institution, not exceeding the current wholesale price of such articles.

All sums derived from the sales of wares manufactured in the industrial departments of the employment institution, together with all lawful accessories and additions, constitute a "revolving industrial fund for the blind," which is to be continually renewed from the proceeds of all sales of goods manufactured by blind artisans in the institution and of raw materials supplied at cost to blind artisans trained there, and from all sums received for maintenance of inmates or for service lawfully rendered for a stipulated price by the institution. The fund is to be expended for the purchase of raw materials for use in the manufacture of brooms, whisks, rugs, chair seats and other wares made by the blind workers, and for the purpose of handling, carrying and marketing the manufactured products of the industrial departments until disposed of, and for the payment of wages earned by the blind employees of the institution, and to provide for such other expenses as are incurred under rules and regulations prescribed by the board of trustees of the institution. When the fund exceeds \$10,000 the

superintendent and board of trustees may use the excess or as much thereof as necessary for the purchase of additional machinery, tools and implements as they think necessary, or for the construction and equipment of additions to the industrial departments. The State Treasurer is the custodian of the fund.

Census of the Blind.

1912.

The Supervisor or Assessor of each township and ward in the state at the time of making his general assessment and assessment roll for his township or ward in each year must set down the name, age, and general health, habits and occupation of every blind person; the degree and duration of blindness; the sex; whether married, single or widowed; the time under medical treatment; the pecuniary ability of the person thus afflicted and of the relatives of such person liable for his support; whether supported wholly or in part by the public; and such further information relative to these classes as may be thought useful. This record is transmitted to the Secretary of State, who must present an abstract of the information to the Governor.

MINNESOTA.

1872.

Article 9, Section 14-a.

Public Debt for State Buildings. For the purpose of erecting and completing buildings for a hospital for the insane, a deaf, dumb and blind asylum, and state prison, the legislature may, by law, increase the public debt of the state, to an amount not exceeding \$250,000.00, in addition to the public debt already heretofore authorized by the constitution, and for that purpose may provide by law for issuing and negotiating the bonds of the state, and appropriate the money only for the purpose aforesaid, which bonds shall be payable in not less than ten nor more than thirty years from the date of the same, at the option of the state.

Chapter 26.

Schools for the Deaf and Blind.

4143. *Location—Organization.* The Minnesota Schools for the Deaf and the Blind shall be continued at Fairbault. They shall be maintained as the school for the deaf and the school for the blind, and shall be grouped and classed with the educational institutions of the state. (1913.)

4144. *Directors—Officers—Meetings.* The board, consisting of the Governor and state superintendent ex officio, and five directors appointed by the Governor for a term of five years and until their successors qualify, and known as the "Board of Directors of the Institute for Defectives," shall be continued and hereafter known as the "Board of Directors of the Minnesota Schools for Deaf and the Blind." Said board shall annually elect from its members a president and a secretary, who shall hold office until their successors qualify. It shall hold monthly business meetings, at which three members shall constitute a quorum. Vacancies in the board shall be filled by the Governor for the unexpired terms. The salary of the secretary shall be fixed by

the board at not to exceed three hundred dollars (\$300.00) a year. (1932.)

4145. *Powers and Duties.* The board shall have the educational management and supervision of the schools, and shall prescribe regulations for the admission and government of pupils, and do all things necessary for their efficient education and training. It shall teach the trades and manual industries most conducive to training for self-support. It shall appoint, and may at pleasure remove, a superintendent for each school. and, upon nominations of the superintendents, such subordinates as may be necessary. (1933.)

4146. *Who May Be Admitted—Expenses.* Any deaf or blind resident of the state of suitable age and capacity for instruction may be received, kept and taught therein, under such conditions as the board may prescribe. He shall be provided by the person legally liable for his support with sufficient funds to furnish him with proper clothing, postage and transportation. If any such person be a pauper, or if the person legally liable for his support is unable to make these provisions for him, of which facts the certificate of the probate judge shall be prima facie evidence, the county in which he has a residence shall annually on or before October 1st pay to the superintendent of which he is an inmate a sum not exceeding forty dollars to be fixed by the board. Such sum shall be used only for clothes, postage and transportation for the pupil. The superintendent shall, on August 1st of each year, render to the County Auditor and to the board of directors a detailed account thereof. (1934.)

4147. *University—Free Tuition.* Any resident of the state graduated from the school for the blind, upon compliance with all other requirements, shall be entitled to pursue any course of study in the state university, without expense for tuition; and the board of regents shall receive him into any department thereof. (1935.)

4148. *Gifts and Conveyances.* The board shall take and hold in trust all lands or other property, granted, given, devised or conveyed to the schools or either of them. All moneys so received, and all incomes from such property shall be deposited in the state treasury, subject to the order of the board. (1936.)

4148. *Annual and Biennial Reports.* On or before November 1st of each year, and whenever required, each superintendent shall make to the board a full report of the work of his school, with such recommendations as he shall deem proper. The board shall make a biennial report to the Governor on or before December 1st preceding each regular session of the legislature. Said report shall contain a full history of the work of each school for the two years ending with the preceding July, with reports of the several superintendents, and other matters usually included in such reports. Said report shall be printed by the state, and five copies furnished to each state officer and member of the legislature, and such number to the board as it shall require, not to exceed five copies for each pupil enrolled. (1937.)

4150. *Certain Children Required to Attend.* Every parent, guardian, or other person having control of any normal child between eight and twenty years of age, too deaf, or too dumb or defective of speech to be materially benefited by the methods of instruction in vogue in the

public schools, shall be required to send such child or youth to the school for the deaf at the City of Fairbault, Minnesota, during the scholastic year of that school. Such child or youth shall attend such school, year after year, until discharged by the superintendent upon approval of the board in control of such institution.

Excusing Attendance. Such board may excuse attendance when satisfied: 1. That the child is in such bodily or mental condition as to prevent his attendance at school or application to study for the period required. 2. That he is afflicted with such contagious or offensive disease or possesses such habits as to render his presence a menace to the health or morals of other pupils, or for any reason deemed good and sufficient by the superintendent with the approval of the board in control of such school. 3. That the child is efficiently taught for the scholastic year in a private or other school, or by a private tutor, the branches taught in the public schools so far as possible.

Penalty. Any such parent, guardian, or other person failing to comply with the foregoing section, shall, upon conviction thereof before the justice of peace or other court, be deemed guilty of a misdemeanor, and shall be fined in a sum not less than five nor more than twenty dollars for the first offense, nor less than ten or more than fifty dollars for the second and every subsequent offense, with costs in every case. Any person who induces, or attempts to induce, any deaf or dumb child to absent himself or herself unlawfully from school, or employs or harbors such child unlawfully from school while said school is in session, shall be deemed guilty of a misdemeanor and shall be fined in a sum not less than five dollars nor more than twenty dollars for the first offense, nor less than ten nor more the fifty for the second, and every subsequent offense, with costs in each case. The principal teacher of every public school in the counties and every truant officer of the cities of St. Paul, Minneapolis and Duluth shall, within 30 days of the close of the school year succeeding the passage of this act, and at corresponding period each succeeding year after, furnish the County Superintendent of Schools or the Board of Education of the cities of St. Paul, Minneapolis and Duluth, as the case may be, with the name, age, sex and address of parent or guardian of all normal children, who are too deaf or too dumb to be educated in the public schools, between the ages of eight and twenty years, inclusive, living within the boundaries of her or his school district who does not attend school. And the County Superintendents of Schools, or the Board of Education of the cities of St. Paul, Minneapolis and Duluth, shall certify forthwith, the names of all such deaf children, with the address of parent, age and sex to the superintendent of the Minnesota School for the Deaf at the City of Fairbault.

Prosecutions. It shall be the duty of the County Attorney to at once prosecute any case of parent or others unlawfully responsible, directly or indirectly, for the failure to place a deaf child or youth in a school for the deaf, when such case shall have been reported to him. (R. L. c. 26, amended '07 c. 407, sec. 1; '09 c. 396, sec. 1.)

4151. *Field and Employment Agency for Blind.* There shall be established under the management of the board of directors of the

school for the blind of the State of Minnesota a field and employment agency for the blind of said state. ('13 c. 488, sec. 1.)

4152. *Same—Superintendent—Powers and Duties of Agency.* The board of directors of said school shall annually appoint, upon the recommendation of the superintendent thereof, a competent person to conduct the work of said agency, under the direction of said superintendent.

Said agency shall collect statistics of the blind, including their present physical and mental condition, causes of blindness, capacity for education and industrial training, and any further information looking toward the improvement of their condition that may be desired.

Said agency shall give especial attention to the cases of such blind youth as are eligible to attendance at the school for blind, but are not in attendance thereat, or are not receiving adequate instruction elsewhere, and shall seek to secure such attendance by all practical means.

Said agency shall endeavor to secure for the adult blind of the state such labor and employment as shall be adapted to their training and ability, and shall, so far as may be feasible, aid said adults in securing any provisions which may be made by the school for the blind for the betterment of the state's blind.

Said agency shall further be empowered to aid the blind (1) by home instruction and training, (2) by assisting them in securing tools, appliances and supplies (3) by aiding in marketing the products of their labors, (4) by care and relief for the indigent blind, and in any other practicable means of alleviating their condition. ('13 c. 488, sec. 2.)

4153. *Same—Expenses.* The board of directors of the Minnesota School for the Blind are hereby authorized to defray the necessary expenses of the aforesaid agency from the appropriations for the current expenses of said board. ('13 c. 488, sec. 3.)

SESSION LAWS OF MINNESOTA FOR 1915.

Chapter 194.

An Act authorizing and empowering any special, independent or common school district in the State of Minnesota, to provide for, establish, conduct and maintain schools for deaf children, blind children, defective speech children and mentally subnormal children in such school districts in certain cases and appropriating money therefor.

Be it enacted by the Legislature of the State of Minnesota:

Section 1. *Education of Deaf Children.* Upon application of any special, independent or common school district, complying with the provisions of this act, made to the State Superintendent of Education, he may grant permission to such district to establish and maintain within its limits one or more schools for the instruction of deaf children who are residents of the state.

Any school district which shall maintain one or more such schools, shall, through its clerk or secretary, report to the State Superintendent of Education annually, or oftener if he so direct, such facts relative to such school or schools as he may require.

The courses and methods of instruction must comply with such requirements as may be outlined by the State Superintendent of Educa-

tion. All schools for deaf children established under this law shall be conducted by the combined system, which includes the oral, aural, the manual and every method known to this profession; and the courses and methods of instruction shall be substantially equal or equivalent in efficiency to the course and methods of instruction established and employed in the State School of the Blind at Fairbault, Minnesota. The State Superintendent of Education may designate any number of his staff as an inspector to visit and note the progress of the schools provided for in this act.

Permission to establish such schools may be granted to districts which have an actual attendance of not less than five deaf children, between the ages of four and ten years, who may come under the provisions of this act. Blind children, defective speech children and mentally subnormal children are not to be admitted to the same class with the deaf children, but must each have classes and teachers.

There shall be paid out of the current school fund in the state treasury annually in the month of July, to the treasurer of the school district board, or of the Board of Education, in the school district maintaining such school or schools under the charge of one or more teachers, whose appointment and qualifications shall be approved by the State Superintendent of Education, the sum of \$100.00 for each deaf child instructed in the school or schools having an annual session of at least nine months during the year preceding the first day of July.

It shall be the duty of the treasurer of the school district or of the Board of Education receiving the aid provided for in this section to render annually to the State Superintendent of Education an itemized statement of all expenditures of said school or schools. Any surplus at the end of the year shall be reserved as a special fund for the education of the deaf children of that district and can be used for no other purpose.

SESSION LAWS OF THE STATE OF MINNESOTA FOR 1915.

Chapter 194, Section 2.

Education of Blind Children. Section 1 of this act shall, so far as applicable, provide for and apply to the schools for the blind, except that there shall be paid out of the current school fund in the state treasury annually in the month of July to the treasurer of the school district maintaining a school or schools for the blind under the charge of one or more teachers whose appointments and qualifications shall be approved by the State Superintendent of Education, the sum of \$100.00 for each blind pupil instructed in such school or schools having an annual session of at least nine months during the year next preceding the first day of July.

Sec. 5. *Limitation of Attendance.* Permission to establish such special classes as may come under the provisions of Sections 2, 3 and 4 of this act may be granted to districts which have an actual attendance of not less than five children, between the ages of four and sixteen years.

Sec. 6. This act shall take effect and be in force from and after its passage.

MINNESOTA.

1915.

SESSION OF LAWS OF MINNESOTA FOR 1915.

Chapter 307. S. F. No. 498.

An Act to provide for the necessary expenses of the blind students in universities, colleges and conservatories of music.

Be it enacted by the legislature of Minnesota:

Section 1. *Blind Students to Receive \$300.00 Expenses While at Universities, Colleges, Etc.* That any blind person who is and for five years immediately preceding the making of his application for aid under this act, has been, a resident of this state, and who is a regularly enrolled student pursuing any course of study, profession, art or science, in any university, college or conservatory of music, approved by the board of directors of the Minnesota School for the Blind, may in the discretion and under the direction of said board receive a sum or sums of money not exceeding \$300.00 in any one year for the purpose of defraying his necessary expenses, including those of a reader, while in attendance upon such university, college or conservatory, such expenditures to be made from the appropriations for the current expenses of the Minnesota School for the Blind, provided that not more than five such blind persons shall receive such aid in any one year.

Sec. 2. This act shall take effect and be in force from and after August 1st, 1915.

Approved April 24, 1915.

MISSISSIPPI.

(Abstract taken from the last United States Census.)

School for the Blind.

1906.

The government of the Institute for the Blind is vested in a board of five trustees, appointed by the Governor with the consent of the Senate for terms of four years. The board may admit into the institute only bona fide residents of the state, of good moral character. It must fix the amount to be paid by pupils for board, the terms of admission, and times of payment, but it must admit free of all charges, upon the certificate of the County Superintendent of Education, all invalid and indigent blind persons who are eligible, provided the amount appropriated by the legislature is sufficient to care for them properly.

Graduates Supplied With Tools.

1910.

When a blind person has graduated from the blind institution, it is the duty of the trustees to furnish him with the necessary tools to carry on his trade. The cost of the tools is not to exceed \$100.

MISSOURI.

1909.

Section 1470. *Government Vested in a Board of Managers.* The government of the Missouri School for the Blind shall be vested in a board of managers composed of five members, one of whom shall be, if practicable, a physician and oculist, and who shall give his professional services gratuitously to the pupils of said school.

Sec. 1471. *Board to Control Property and Affairs.* The board of managers are invested with the general control and direction of the property and affairs of the institution, with power to direct such purchases as, under the advice of the superintendent, may be deemed necessary for the comfort, health and educational advancement of the pupils. They shall prescribe rules, regulations and by-laws for the government, discipline and management of the school, and shall conduct its concerns agreeably to the requirements of law and the rules, regulations and by-laws of the institution.

Sec. 1472. *Officers to Be Appointed.* The board shall have authority to appoint a superintendent and such number of teachers as may from time to time be required; also a professor of music, a matron and a foreman of the mechanical department for males, and a female teacher of handicraft for females, all of whom shall be qualified to impart instruction to the blind, and who shall be known as the officers of the institution; but the other officers may, at the discretion of the board, occupy other buildings, to be provided and furnished at their own expense. No person shall board or lodge in said institution who is not a pupil or employe thereof, except the officers and their families.

Sec. 1473. *Duties of Officers to Be Prescribed in the By-laws.* The board of managers shall, in their rules, regulations and by-laws, prescribe the duties of the respective officers and fix the terms of the same. They may at their pleasure remove any officer, teacher or other employe.

Sec. 1474. *The Treasurer.* There shall be a treasurer of said institution appointed by the board of managers, who shall give bond for the faithful performance of his trust, in such sum and with such sureties as shall be required by the said board. He shall have the custody of all moneys, obligations and securities belonging to the institution, and shall make payments on such warrants and orders as may be prescribed in the by-laws of the institution. He shall submit to the board each month a statement of all moneys received and a list of all warrants, orders or checks paid by him the past month, giving the names of all persons to whom such payments were made.

Sec. 1475. *Salaries.* The superintendent shall receive for his services a salary of two thousand dollars per annum; the matron shall receive for her services a salary of six hundred dollars per annum; the treasurer shall receive for his services such compensation as shall be fixed by the board. The board of managers shall fix the salaries and wages of all other officers, teachers and employes of the institutions; which salaries and wages of all officers, teachers and employes shall be allowed and paid every month.

Sec. 1476. *Actions for Trespass, Etc., How Instituted.* For all damages for trespass and other wrongs to the institution or any other property thereof, real or personal, actions may be maintained in the name of the board of managers as such; and all damages recovered in such actions shall be appropriated to the reparation of the property injured, and to other purposes of the institution.

Sec. 1477. *Qualifications of Superintendent—Oath.* The superintendent shall be a teacher of knowledge, skill and ability in his profession, and of experience in the management and instruction of the blind. He shall not, while such superintendent, engage in any other

employment, but shall, to the exclusion of all other business, devote himself to the instruction, supervision and care of the institution and its inmates. Before entering upon the duties of his office he shall take an oath or affirmation that he will diligently, faithfully and impartially discharge all the duties required of him by law.

Sec. 1478. *Powers and Duties of Superintendent.* The superintendent shall be the chief executive officer of the institution; he shall see that the several officers of the institution faithfully and diligently discharge their respective duties and upon failure thereof shall make report of the facts to the board of managers; he shall receive such blind as shall be entitled to admission into the school, and discharge them therefrom; provided that he shall at all times exercise the powers and perform the duties herein mentioned according to the rules and by-laws of the institution.

Sec. 1479. *Accounts to Be Kept, Etc.* The board of managers shall keep a full and correct account of their proceedings in books to be provided for that purpose. The officers of the school shall make report, through the superintendent, to the board, as it may from time to time require. The board shall make detailed reports biennially to the general assembly of their proceedings, the condition of the institution, the number of pupils, and other facts connected with the institution, including the exact receipts and expenditures of the board, accompanied by the biennial reports of the superintendent and the treasurer to the board.

Sec. 1480. *Meetings of the Board.* The board of managers shall meet once a month to receive the monthly reports of the superintendent and treasurer, and transact such business as may be brought before them.

Sec. 1481. *Who Entitled to Benefits of Institution.* All blind persons of suitable mental and physical capacity between the ages of six and twenty years, residing in this state, shall be entitled to the benefits of the institution, and shall be permitted to remain in said institution for the term of twelve years, unless, in the discretion of the board, they shall be sooner discharged therefrom; but the board may in its discretion retain a pupil for a longer period. But in no case shall any person be admitted into the institution who is not a bona fide resident of the state; provided, however, that blind persons of this state over the age of twenty years may be admitted at the discretion of the board.

Sec. 1482. *Duty of County Court When Blind Person Unable to Pay Expenses.* Whenever, upon petition of any person, and satisfactory evidence adduced to the county court of any county in this state, that there is a blind person, between the ages of nine and twenty-five years, residing in such county, and such blind person is entitled to the benefits and advantages of the Missouri School for the Blind, and the parents or guardian of such blind person are unable to pay the expenses of such blind person at such school, the county court, with the consent of the parents or guardian of such person, may order such blind person sent to such school at the expense of the county, and such person shall be admitted into such school as indigent persons.

Sec. 1483. *Eyes of Pupils to Be Examined, Etc.* It is hereby made

the duty of the board of managers to have the eyes of every pupil who may be admitted into said school carefully examined by the physician and oculist of the said school, and if, upon such examination by such physician and oculist, it shall appear that by medical treatment, or by surgical operation, the sight may be improved or restored, he shall, with the consent of the board, and with the further consent of the parents or guardian of such pupil, when it is practicable to obtain such consent, institute such medical treatment or perform such surgical operation as in his judgment may be deemed practicable and advisable; and if such treatment or operation shall prove successful, the pupil shall be discharged from said school as soon thereafter as may be thought prudent.

MISSOURI.

1913.

PENSIONS.

Cities to Care for Their Blind; Indigent Confederate Veterans Granted Monthly Allowance.

The Forty-seventh General Assembly (Session of 1913) adopted a joint and concurrent resolution submitting to the qualified voters of the State of Missouri an amendment to the constitution thereof, concerning the granting and payment of pensions or allowances to the deserving blind, as follows:

Be it resolved by the Senate, the House of Representatives concurring therein, as follows: That at the general election to be held on Tuesday next following the first Monday in November, A. D. 1914, the following amendment to the Constitution of Missouri, concerning the granting and payment of pensions or allowances to the deserving blind, shall be submitted to the qualified voters of said state, to-wit:

Section 1. That Section 47 of Article 4 of the Constitution of Missouri be amended by adding thereto the following words: "and provided further, that nothing in this or the preceding section shall be construed as prohibiting the general assembly from making provision by law for the granting and payment of pensions or allowances to the deserving blind, or from authorizing by law any counties, cities or incorporated towns or villages of this state to provide for the granting and payment of such pensions or allowances."

MISSOURI.

1915.

Sec. 36-a. *Readers for Indigent Blind Students.* There is hereby appropriated out of the state treasury, chargeable to the general revenue fund of the state, the sum of \$2,400, to provide for readers for certain indigent blind students in institutions of higher learning in the state.

Sec. 1. *Classifications, Etc.* That Article 10, Chapter 19, Revised Statutes of Missouri, 1909, relating to the school for the blind, be and the same is hereby amended by adding a new section thereto to be known and numbered as Section 1470-a. *Classification, etc.* The Missouri School for the Blind shall be regarded, classed and conducted wholly as an educational institution of the state, and its classification, conduct and management shall be wholly separate and distinct from

that of the benevolent, charitable, custodial and correctional institutions of the state.

Approved March 23, 1915.

MISSOURI.

1915.

Be it enacted by the General Assembly of the State of Missouri, as follows:

Section 1. *Missouri Commission for the Blind—How Constituted—Appointment—Tenure.* The Governor shall appoint, by and with the consent of the Senate, five persons, who shall constitute the Missouri Commission for the Blind. The first appointment hereunder shall be made as soon as may be after this article takes effect, and the Governor shall designate two of said appointees to serve for a term ending two years from the first day of January, 1915, and three to serve for a term ending four years from the first day of January, 1915; thereafter appointments shall be made for the full term of four years. All appointees hereunder shall hold office until their successors are appointed and assume the duties of office.

Sec. 2. The duties of said commission shall be to prepare and maintain a complete register of the blind persons within this state and to collate information concerning their physical condition, cause of blindness and such additional information as may be useful to the commission in the performance of its other duties as herein enumerated, and to investigate and report to the general assembly from time to time the condition of the blind within this state, with its recommendations concerning the best method of relief for the blind; to adopt such measures as the commission may deem expedient for the prevention and cure of blindness; to establish and maintain at such places within this state as the commission may deem expedient shops and workrooms for the employment of blind persons capable of useful labor, and to provide superintendence and other assistance therefor and instruction therein; to compensate the persons so employed in the manner and to the extent that the commission shall deem proper; to provide such means for the sale of the products of the blind as the commission shall deem expedient; to act as a bureau of information for the purpose of securing employment for the blind of this state elsewhere than in the shops and workrooms of the commission, and to this end the commission is authorized to procure and furnish materials and tools and to furnish aid and assistance to blind persons engaged in home industries and to buy and sell the products of the blind wherever and however produced within this state; to provide for the temporary cost of the food, raiment and shelter of deserving blind persons engaged in useful labor; to ameliorate the condition of the blind by such means consistent with the provisions of this act as the commission may deem expedient: Provided, however, that no part of the funds appropriated by the state shall be used for solely charitable purposes; the object and purpose of this act being to encourage capable blind persons in the pursuit of useful labor and to provide for the prevention and cure of blindness.

Sec. 3. *Commission Authorized to Receive and Expend Donations and Bequests.* Said commisison is authorized to receive and use for the

purposes hereinbefore enumerated, or any of them, donations and bequests, and is authorized to expend such donations and bequests in such manner as it may deem proper within the limitations imposed by the donors thereof.

Sec. 4. *Commission May Adopt By-Laws or Rules and Regulations—Quorum—Agents and Employes—To Report to General Assembly.* Said commission may adopt by-laws or rules and regulations for its government; a majority of the commission shall constitute a quorum. It shall have power to appoint such agents and employes as it shall deem necessary and fix their compensation within the limits of the appropriation that shall be made by the general assembly; it shall hold regular monthly meetings, keep a full record of its proceedings and of its receipts and disbursements, and shall, on or before the first Monday in January of each biennial period, make a full report to the general assembly, presenting a concise review of the work of the commission for such period, with recommendations looking to the amelioration of the blind in this state.

Sec. 5. *Compensation—Expenses.* The members of the commission shall receive no salary or other compensation for their services, but their traveling expenses and other necessary expense in the performance of their duties may be allowed and paid them out of any funds that may be appropriated by the state for the use of said commission.

Approved March 13, 1915.

MISSOURI.

(Abstract taken from the last United States Census.)

School for the Blind.

1913.

The course of study in all institutions for the instruction of the blind must be of such a character as to qualify a student graduating from any of them to admission in any of the higher institutions of learning in the state.

The board of directors of each district must in connection with the school census annually take or cause to be taken an enumeration of all blind persons of school age residing in their districts. (1909.)

Blind Students in General Institutions.

1913.

A blind citizen of the state who is a student in actual attendance at a college, university or technical or professional school located within the state and authorized to grant degrees, other than an institution for the blind, may, if he is designated by the county court of his county as indigent, receive from the state \$300 a year with which to employ a reader.

MONTANA.

(Abstract taken from the last United States Census.)

School for the Blind.

1909.

The general control and supervision of the Montana School for the Deaf and Blind is vested in the State Board of Education, but the board confers upon the executive board of the school such authority relative to the immediate management, other than financial, as it thinks

expedient. The board of education appoints the president of the school and fixes his salary. The executive board consists of the president of the school, ex-officio chairman, and two members appointed by the Governor with the consent of the board of education. At least two of the three members of the board must reside in the county where the institution is located. The appointed members of the board hold office four years and receive such compensation as the board of education determines, not to exceed \$5 for each day actually spent in the discharge of their duties, and not exceeding \$125 in any one year, for each member. All expenses necessarily incurred by them in the discharge of their duties are paid by the state.

The object of the school is to furnish all children who are debarred from the public schools by reason of deafness, dumbness, blindness or feeble-mindedness with at least an ordinary public school education in all the customary branches, and to train them into mastery of such trades as will enable them to become independent and self-sustaining citizens.

All blind persons between the ages of 6 and 21 years residing in the state and not of unsound mind or dangerously diseased in body, or of confirmed immorality, or incapacitated for useful instruction by reason of physical disability, are eligible for admission to the school, and all pupils are entitled to 10 years of attendance. Upon special petition approved by the president, by any pupil who has completed the course of 10 years, he may be allowed two additional years. Pupils may be expelled for sufficient cause. When there is room non-resident blind persons may be admitted to the school upon payment in advance of a year's cost of maintenance.

In all cases where a person to be sent to the school is too poor to pay for the necessary clothing and transportation the expenses are to be paid by the president of the school and charged against the county of the blind person's residence. (1907.)

Compulsory Education.

1907.

Every parent, guardian or person having custody of any child who is blind to be educated in the public schools must send the child if of lawful age, to the institution for the blind for six months of each year for the period of eight years, unless the child is taught in a private school, at home, or in a similar institution in another state, in such branches as are taught in the state institution, or unless the child be excused by the authorities on account of mental or physical disability; Provided, that the child must be required to attend the private school or institution, as provided for above, not less than six months of each year for eight years, or until he has arrived at the limit of the lawful school age. The school district clerks of each county must annually report to the county superintendent of schools the names, ages and addresses, and the names of parents and guardians, of every blind person between the ages of 5 and 21 years, residing in the school district. The county superintendent must send a complete list of the names, ages and addresses of all such persons in their county to the president of the school for the blind.

NEBRASKA.

1915.

Be it enacted by the people of the State of Nebraska:

Section 1. *Relief of Blind.* There is hereby appropriated \$2,000 as a nucleus of a fund for the relief of the blind in this state.

Sec. 2. *How Used.* Said relief fund shall be employed in any suitable effort to minimize the evil of blindness in this state, but any portion of said relief fund contributed by the state shall be reserved to the following named uses, to-wit:

(a) To collect, interpret and publish data relating to the cause, prevention and cure of blindness, the means employed or advocated for ameliorating the condition of the blind, the number, location, character and condition of the blind of this state.

(b) To provide home teaching for the blind.

(c) To encourage home industry by assisting the workers in obtaining supplies and in finding a market.

(d) To assist worthy and competent persons in finding remunerative employment suited to their needs and capacities.

(e) To assist worthy and talented persons in pursuing studies more advanced, or more technical than those offered by the Nebraska Institution for Blind.

Sec. 3. *Blindness Defined.* The term "blindness" is defined to include all defects of the organs of vision which limit success and happiness. The term "blind" shall include all persons who need assistance, and whose need is primarily due to said limitation, but in each case the relief granted shall be suited to the beneficiary's need and to his willingness and capacity to profit thereby.

Sec. 4. *Advisory Board.* The superintendent of the Institution for the Blind at Nebraska City and the executive board of the Nebraska Association of Workers for the Blind shall form an advisory board for carrying out the purposes of this act. Said board shall act in co-operation with the board of commissioners of state institutions. All state appropriations and funds contributed to the relief fund provided in this act shall be expended only under the authority and supervision of said board of commissioners of state institutions.

Sec. 5. *Contributions to Fund.* The advisory board described in the preceding section may solicit and receive contributions either for immediate use or endowment of the relief fund, giving receipts therefor. All such funds when received shall be deposited or invested under authority of the board of commissioners of state institutions and held subject to its order.

Approved April 13, 1915.

Section 1. *Amendment.* That Sections 7210 and 7211, Revised Statutes of Nebraska for 1913, are hereby amended to read as follows:

7210. Sec. 32. *School of Deaf.* The purpose of the school for the deaf, now established and located at Omaha, in Douglas County, and of the school for the blind, now established and located at Nebraska City, in Otoe County, shall be the physical, moral and intellectual culture and training of the respective classes for whose benefit such institution was created, to the end that the pupils in each institution may be

returned to society capable of becoming self-sustaining and useful citizens.

7211. Sec. 33. *Same—Name.* In order to be better known and more fully recognized as strictly educational institutions, the name of the state school known as the "Nebraska Institute for the Deaf and Dumb" shall be changed to "Nebraska School for the Deaf," and the name of the institution for the blind shall be changed to "Nebraska School for the Blind."

Approved April 13, 1915.

NEBRASKA.

(Abstract taken from the last United States Census.)

School for the Blind.

1913.

The board of commissioners of state institutions has the oversight and general control of the Nebraska School for the Blind. The purpose of the school is the physical, moral and intellectual culture and training of the blind, to the end that they may be returned to society capable of becoming self-sustaining and useful citizens. All blind persons and those blind to such an extent that they can not acquire an education in the common schools of the state, and who are of suitable age and capacity and of good moral character, are entitled to an education in the institution for the blind, without charge. The parents or guardians must furnish suitable clothing and traveling expenses and support the pupil during the summer vacation, but if they do not do so the county of his residence is charged with the expense of his clothing and transportation home, and it must collect from the parent or guardian, if the person is a minor, or from himself if he is an adult. In all cases where the parent or guardian is unable to pay the necessary expenses and the pupil is a pauper, the county of his residence must pay. Persons not residents of the state may avail themselves of the benefits of the school by complying with the conditions of admission for citizens of the state and paying in advance a sum fixed by the governing board.

Compulsory Education.

1913.

All persons between the ages of 7 and 18 years who, by reason of partial or total blindness, are unable to obtain an education in the public schools are required to attend the state school for the blind, unless they are being privately or otherwise educated.

Each county superintendent of common schools must report to the superintendent of the state school for the blind the name, age and address of every blind person and of every person blind to such an extent as to be unable to acquire an education in the common schools who resides in his county.

Exemption of the Blind.

1913.

The blind are specially exempted from the laws applicable to tramps.

NEVADA.

(Abstract taken from the last United States Census.)

Education of the Blind.

1912.

The superintendent of public instruction is authorized to make arrangements with the directors of any institutions for the blind in the states of California or Utah for the admission, support, education and care of the blind of the state.

Upon the application under oath of a parent, relative, guardian or nearest friend of any blind resident of the state, to the effect that by reason of blindness such person is disqualified from being taught by the ordinary process of instruction and education, and that they are unable to pay for his support, education and instruction in any of the institutions mentioned above, filed with the board of county commissioners of the proper county, if the board is satisfied with the truth of the statements, it may make application to the superintendent of public instruction for the purpose of having him issue a certificate to that effect, which certificate being produced is the authority of the directors of any of the prescribed institutions for receiving the blind person.

All blind persons that are not mentally or physically incapacitated to receive an education or instruction, that are free from offensive or contagious diseases, and are unable to pay for their support, education and instruction in any of the institutions specified, and whose parent, relative, guardian or nearest friends is unable to pay, are entitled to the benefits of these provisions, and the county of the person's residence must furnish the necessary expenses for carrying the person to the office of the superintendent of public instruction, who must make all necessary arrangements for carrying him to an institution at the expense of the state. All blind persons over 21 years of age seeking admission into the institutions must be bona fide residents of the state for five years previous to the filing of their applications.

NEW HAMPSHIRE.

1913.

Chapter 117.

An Act to provide for the Blind of the State of New Hampshire.

Be it enacted by the Senate and House of Representatives in General Court convened:

Section 1. The state board of charities and correction are hereby authorized to prepare and maintain a register of the blind in the state which shall describe their condition, cause of blindness, capacity for education and industrial training and such other data as said board may deem advisable.

Sec. 2. The state board may act as a bureau of information and industrial aid for the blind, and for this purpose in their discretion may furnish materials and tools to any blind person and may assist such blind persons as are engaged in home industries in marketing their products, and may assist the blind in finding employment and in developing home industries for them, and may ameliorate the condition of the blind by devising means to facilitate the circulation of books, by

promoting visits among the aged or helpless blind in their homes, and by such other methods as it may deem expedient: Provided, that the said board shall not undertake the permanent support or maintenance of any blind person.

Sec. 3. The state board of charities may in their discretion contribute to the support of the blind persons from New Hampshire receiving instruction in industrial institutions outside of the state.

Sec. 4. Said board may appoint such officers and agents as may be necessary to assist in carrying into effect the purposes of this act and fix the compensation of such persons within the limits of the annual appropriation, but any person employed by the board shall not be a member of the board, and there may be expended during the next two years a sum not exceeding five thousand dollars per year in carrying into effect the provisions of this act.

Sec. 5. This act shall take effect from and after the first day of September, 1913.

Approved May 7, 1913.

NEW HAMPSHIRE.

1915.

Chapter 188.

Joint Resolution in Favor of Industrial Institution for the Blind.

Resolved by the Senate and House of Representatives in General Court convened:

That the Governor be authorized to appoint a committee of three to investigate the need and advisability of establishing an industrial institution for the blind, such committee to report their findings and recommendations to the general court of 1917, and that the Governor be authorized to draw his warrant for the expenses of such investigation from any moneys not otherwise appropriated.

Approved March 11, 1915.

Chapter 94.

An Act for the Relief of Needy Blind.

Be it enacted by the Senate and House of Representatives in General Court convened:

Section 1. Any person of either sex who, by reason of loss of eyesight, is unable to provide himself with the necessities of life, who has not sufficient means of his own to maintain himself, and who, unless relieved as authorized by these provisions, would become a charge upon the public or upon those not required, by law to support him, shall be deemed a needy blind person.

Sec. 2. In order to receive relief under these provisions, a needy blind person must become blind while a resident of this state, and shall be a resident of the county for one year and of the state for five years.

Sec. 3. At least ten days prior to action on any claim for relief hereunder, the person claiming shall file with the county commissioners a duly verified statement of the facts bringing him within these provisions. The list of claims shall be filed in a book kept for that purpose, in the order of filing, which record shall be open to the public.

Sec. 4. No certificate of qualification of drawing money hereunder shall be granted until the county commissioners shall be satisfied, from

the evidence of at least two reputable residents of the county, one of whom shall be a registered physician, that they know the applicant to be blind, and that he has the residential qualifications to entitle him to the relief asked. Such evidence shall be in writing, subscribed to by such witnesses, and be subject to the right of investigation by the county commissioners.

Sec. 5. If the county commissioners be satisfied that the applicant is entitled to relief hereunder, they shall furnish aid to said applicant in such sum as they find needed, not to exceed one hundred and fifty dollars per annum, to be paid from the county treasury, and such relief shall be in place of all other relief of a public nature.

Sec. 6. If the county commissioners, in the examination of the qualifications of any person filing a claim for relief hereunder, or who may have been allowed relief by such commissioners, shall determine upon the evidence of a registered physician and surgeon that any person or persons making such claims or then on such lists might have such disability benefited or removed by proper surgical operation or medical treatment, and such person entitled to such relief files his consent in writing thereto, then the county commissioners may expend for the purpose of such surgical operation or medical treatment all or any portion of the relief which the county commissioners may award to such person for one year under the provisions of this act; and in such case shall pay the sum so awarded to the persons entitled to pay for such surgical operation or medical treatment, instead of being paid to the person entitled to such relief.

Sec. 7. The county commissioners annually shall make examination as to qualifications of any one on the blind list, and increase or decrease the amount within the limits herein prescribed. If not satisfied that the person on the list is qualified to draw his money, said commissioners shall remove such person from the list.

Sec. 8. The county commissioners may at any time during the year inquire into the qualifications and examine as to the disability and needs of any person theretofore placed on such blind list; and in case said commissioners find that any person is not qualified to draw further relief, or that such disability has been removed in whole or in part, then said commissioners may at any time thereafter during such year modify or change the amount theretofore found necessary for such relief, or remove such person from the list qualified to draw any money for relief.

Sec. 9. Whoever, to secure for himself or another the benefit provided in this chapter for needy blind persons, makes a false statement shall, upon conviction, be deemed guilty of perjury.

Sec. 10. This act shall take effect upon its passage.

Approved April 7, 1915.

NEW HAMPSHIRE.

(Abstract taken from the last United States Census.)

Exemption of the Blind.

1901.

The blind are specially exempted from the laws applicable to tramps.

NEW JERSEY.

1873.

An Act for the instruction and maintenance of indigent deaf and dumb, blind and feeble-minded persons, inhabitants of this state.

1. That an annual sum, not exceeding three hundred dollars for each person, be appropriated out of any moneys in the treasury not otherwise appropriated to be applied under the direction of the Governor or person administering the government, for the instruction or placing for instruction in some suitable and convenient institution such indigent deaf and dumb, blind or feeble-minded persons or partially deaf and dumb, or partially blind inhabitants of this state, as may be selected under this act.

2. That whenever the Governor, or persons administering the government shall be satisfied that the resources of any pupil applying for the benefit of this act or those of his or her parents or guardians, are insufficient to defray the expenses of clothing such pupil, then the Governor, or person administering the government, may cause an additional sum to be paid, not to exceed thirty dollars per annum for each pupil.

P. L. 1904, p. 268.

Amendment to P. L. 1873, p. 45.

Section 3 be and the same is hereby amended to read as follows:

3. That all applications for the admission of pupils must be accompanied by the certificate of two reputable freeholders, residents of the city, town or township in which the applicant resides, attested before a magistrate, and said certificate shall clearly set for the age, circumstances and capacity of such pupil and of the ability of the parent, parents, guardian or custodian of such pupil to pay any part of the expense of tuition, care and maintenance of the person in whose behalf such application may be made: Provided, that such certificate shall also be approved by the judge of the Court of Common Pleas of the county in which such applicant resides, as to the ability or inability of the parent, parents, guardian or custodian of such child to pay any part of the expenses of tuition, care and maintenance; and such judge shall, before approving such certificate satisfy himself as to the ability of the parent, parents, guardian or custodian of such to pay all or any part of such expense.

4. That the Governor, or person administering the government shall have the power to receive and decide upon all applications for the benefit of the legislature provisions made or to be made for the instruction of such beneficiaries.

5. That the Governor, or person administering the government, shall have the power to withdraw the name of any pupil from the list of those instructed at the charge of the state if it appears that such pupil was improperly admitted, or after a fair trial to be found incapable of instruction, and in such case due notice shall be given by the Governor to the principal of any institution in which such pupil so withdrawn is an inmate.

6. That the term of instruction shall be three years, but may be extended to a term not exceeding in all eight years, and the application

for the extended term shall be indorsed by the principal of the institution to which the beneficiary may have been sent. P. L. 1875, p. 11, Sec. 1. That whenever any person entitled to the benefits of this act and who shall have been in any institution for the term of eight years, shall make application to the Governor, indorsed by the principal of such institution, for an extension of term, such application can be granted, and the term of years shall be left to the discretion of the Governor.

7. That it shall be the duty of the Governor, or person administering the government, to request the principals of the several institutions to which such pupils shall be sent, to transmit to him every year, statements in writing of the progress in learning and general standing of each pupil supported by the state.

P. L. 1910, p. 211.

Amendment to P. L. 1893, p. 327.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

8. I. Section 1 of the said act be and the same is hereby amended so that henceforth said Section 1 shall read as follows:

Any deaf and dumb, blind or feeble-minded person, of a suitable age and capacity for instruction, may be entitled to the benefits of this act.

9. That whenever any person entitled to the benefits of this act shall become a legal charge upon the overseers of the poor of any township in this state, it shall be the duty of such overseer or overseers to make immediate application in behalf of such person in the manner hereinbefore prescribed; and if such person shall be placed in any institution for instruction, then the expenses of conveying him or her with suitable clothing during his or her term of instruction shall be defrayed by such township.

10. That each beneficiary of the State of New Jersey in the institutions for the instruction of blind persons, shall be entitled to a Vienna writing box, the costs of the same not to exceed the sum of ten dollars, which such shall be paid on recommendation of the Governor out of the state treasury upon a warrant from the Comptroller.

11. That whenever the Governor, or person administering the government, shall be satisfied that the resources of any person applying for the benefit of this act, or those of his or her parents or guardians are sufficient to defray a part of the expense of instructing such person, but not sufficient to defray the whole expense, then the Governor, or person administering the government aforesaid, may cause to be paid such proportion as to him may seem just and equitable, of the annual expense of educating such person.

12. That all acts heretofore passed, and the several supplements thereto, in reference to the maintenance, support and instruction of the deaf and dumb, blind and feeble-minded persons, inhabitants of this state, be and the same are hereby repealed.

15. Sec. 2. That an annual sum not exceeding two hundred and thirty dollars for the training and maintenance of each female hereinbefore described shall be appropriated out of any moneys not otherwise appropriated.

16. Sec. 3. That this act shall not conflict with Sections 3, 4 and 11 of the General Act to which this is a supplement.

P. L. 1904, p. 267.

Supplement to P. L. 1873, p. 45.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

1. That any parent, parents, gurdian or custodian who shall make application to have any person admitted to any institutions coming under the provisions of this act shall in such application waive all right to remove such inmate of either permanently or for a limited time; provided, that any inmate may be discharged upon request of the Governor of this state on the recommendation of the principal, superintendent or person at the head of such institution; and provided further, that the person at the head of such institution may grant a leave of absence to any inmate for a limited time.

P. L. 1909, p. 208.

An Act constituting a commission for ameliorating the condition of the blind, and defining its powers and duties.

Be it enacted by the Senate and the General Assembly of the State of New Jersey:

1. That the Governor of this state appoint three citizens thereof to constitute a commission for the purpose of ameliorating the condition of the blind. Each of the members of said commission shall hold office for a term of three years and until their successors are appointed and qualified. Any vacancy occurring in the said commission shall be filled by the Governor for the unexpired term only. The members of said commission shall receive no salary, but shall receive their actual and necessary expenses incurred in carrying out the provisions of this act.

2. It shall be the duty of said commission to provide any and all means which, in their judgment, shall be deemed feasible for ameliorating the condition of the blind, and by reports to be made to the Governor from time to time as said commission may deem proper to recommend means and method for the prevention of blindness. Said commission shall prepare and maintain a register of all the blind in this state. It shall be the duty of every physician to report to said commission each and every case of defective vision where, in the judgment of said physician, the person suffering from said defective vision may become permanently blind.

For the purpose of carrying out the provisions of this act, including the necessary expenses of said commission, the sum of fifteen hundred dollars is hereby appropriated to be paid to said commission from time to time in the manner provided by law.

This act shall take effect immediately.

P. L. 1910, p. 330.

An Act concerning admissions to feeble-minded, epileptic, tubercular and blind institutions.

1. All applications for admission to any institutions supported in whole or in part by this state and operated for the care and custody of the feeble-minded, epileptic or tubercular patients of the state and for the admission of blind persons of this state in any institution for

the blind, shall be filed in the office of the Commissioner of Charities and Corrections, and admission to these institutions shall be upon the certificate of said Commissioner of Charities and Corrections, upon his being satisfied that all the provisions of law relating thereto have been complied with, and that the medical director or superintendent of such institutions has approved the application, and that it is in all respects a proper case for admission into such institution.

2. After he shall approve of said application it shall be the duty of the Commissioner of Charities and Corrections to make an investigation as to the financial condition of the party or parties making the application for the purpose of ascertaining whether it is possible for them to pay in whole or in part for the maintenance of the patient; and he shall keep an accurate record of all requests for admission, admissions, discharges, deaths, etc., with relation to patients, and to make such rules and regulations for the care and custody of such records as in his judgment he deems to be wise or useful for the state.

3. All acts or parts of acts inconsistent herewith are hereby repealed, and this act shall take effect immediately.

P. L. 1910, p. 334.

Further Supplement to P. L. 1873, p. 45.

1. Any male person admitted to any of the institutions of this state coming under the provisions of this act may be paroled into the custody of his parents, guardians or any fit person under such conditions that he may be liable at any time to be taken back to such institution, if the conditions of his parole are violated, or if, in the judgment of the Commissioner of Charities and Corrections of this state, for any cause his welfare may so require; provided that in case of such parole any liability upon the state for further compensation to support any such inmate shall cease during the time such inmate is out on parole.

P. L. 1910, p. 519.

Appropriations:

For clothing, maintenance, support and instruction of the blind persons, inhabitants of this state, seventeen thousand five hundred dollars (\$17,500).

JOINT RESOLUTION NO. 8.

Joint Resolution authorizing the appointment of a commission to investigate and report upon the condition of the blind residents of this State, to investigate the methods by which other states provide for the blind, and to recommend remedies by which the condition of the blind in this State may be ameliorated.

Be it Resolved by the Senate and General Assembly of the State of New Jersey:

1. The Governor is hereby authorized to appoint a commission of five persons, two of whom may be women, to examine the condition of the blind in this State, and the provisions made and methods employed by other States to ameliorate the condition of their blind. This commission shall report to the next Legislature, and make such recommendations as may seem best suited for advancing the interests of the blind.

2. The members of said commission shall have power to select and employ a clerk and other necessary assistants.

3. The commissioners shall serve without compensation, but shall receive their actual expenses and disbursements, to pay which, and the compensation and expenses of the clerk and other assistants, the sum of one thousand dollars is hereby appropriated, which expenses and disbursements shall be paid by the State Treasurer, upon warrant of the State Comptroller, upon itemized vouchers therefor, certified to by the commissioners and approved by the Governor.

4. This resolution shall take effect immediately.

Approved April 9, 1908.

Chapter 82, P. L. 1911.

An act to amend an act entitled "An act constituting a commission for ameliorating the condition of the blind, and defining its powers and duties, approved April sixteenth, one thousand nine hundred and nine.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

1. Section one of the act to which this act is an amendment shall be amended so as to read as follows:

1. The Governor of this State shall appoint five citizens thereof to constitute a commission for the purpose of ameliorating the condition of the blind, at least one of whom shall be a blind person.

Each of the members of said commission shall hold office for a term of three years and until their successors are appointed and qualified. Any vacancy occurring in said commission shall be filled by the Governor for the unexpired term only.

The members of said commission shall receive no salary, but shall receive their actual and necessary expenses incurred in carrying out the provisions of this act.

Approved March 30, 1911.

*An Act to amend an act entitled "An Act constituting a commission for ameliorating the condition of the blind, and defining its powers and duties," approved April sixteenth, one thousand nine hundred and nine.

Chapter 234, P. L. 1911.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

1. Each board of education in this State shall ascertain what children, if any, there are in the public schools who are three years or more below the normal. In each school district in this State in which there are ten or more children, three years or more below the normal, the board of education thereof shall establish a special class or classes for their instruction, no class, however, to contain more than fifteen children. In each school district in this state where there are ten or more blind or deaf children who are not now cared for in an institution, a special class or classes shall be organized for their education, no such class, however, to contain more than fifteen pupils. Such classes shall be discontinued when proper provision is made for the care and education of such blind and deaf children by the state. The

medical examiner of the district shall examine the children in special classes at least once in every three months.

2. This act shall take effect immediately.

Approved April 27, 1911.

*A supplement to an act entitled "An act to establish a thorough and efficient system of free public schools and to provide for the maintenance, support and management thereof," approved October nineteenth, one thousand nine hundred and three.

An act to provide tuition for the higher education of the blind.

Chapter 336, Laws of 1912.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

1. Whenever any blind person, who is a citizen of this state, desires to attend any college, university, technical school or professional school, authorized by law to grant degrees, other than an institution established for the regular instruction of the blind, shall make application for such purpose to the Commissioner of Education, and be designated by him as a fit person to be received and accepted as a student in any of such institutions, such applicant shall thereupon be entitled to have the aid and assistance hereinafter provided for; provided, that such blind person shall also prove to the satisfaction of said commission that he is financially unable to defray the expense, or any part thereof, hereinafter specified.

2. There shall be paid by the state for the use of such student a sum not to exceed two hundred dollars (\$200) per annum, with which to defray the fee charged by any such institution, and also the further sum of three hundred dollars (\$300) per annum with which to employ a person or persons to read to such student from text-books and pamphlets which shall be necessary for such student to use in connection with the pursuit of his or her studies at the college, university or school where he or she shall be matriculated.

2. It shall be necessary in every case for any such student to receive his or her tuition from a college, university, technical school or professional school, established and located within the state of New Jersey.

4. Any moneys to be paid under the authority of this act shall be paid quarterly, after the beginning of the school year of any college, university, technical or other school, where any blind student shall be matriculated, by the treasurer of the state, on the warrant of the comptroller to the treasurer of any such college, university, technical or other school, upon his presenting an account showing the actual number of blind students matriculated and attending the institution of which he is treasurer, which account shall be verified by the president of any such institution.

5. It shall be necessary for every college, university, technical or other school in which any blind student is matriculated to furnish to the commissioner of education a quarterly report showing the progress or status of every such blind student matriculated in such college, university, technical or other school, and in the event that any of said reports shall disclose the fact that any student is unable to keep up with his or her studies and acquire the education provided for by any

such college, university, technical or other school, or that any of such students are not taking advantage of the opportunities provided for him or her by the terms of this act, then in every such case, if it shall be the judgment of the commissioner of education that the aid and assistance offered and provided by this act shall be denied and withdrawn from any such student, then the same, on the recommendation and certificate of said Commissioner of education, shall be withdrawn from any such student, and the college, university, technical or other school in which any such student is entered or matriculated, shall be notified by the State comptroller of every such action.

6. This act shall take effect immediately.

Approved April 1, 1912.

An Act to amend an act entitled "An act to regulate the importation of dependent children, and providing a penalty for violation thereof," approved May tenth, one thousand nine hundred and seven, so as to admit the importation of blind children under the age of twelve years.

Chapter 201, Laws of 1912.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

1. Paragraph two of the act referred to in the title of this act is hereby amended to read as follows:

2. Such person, corporation, association or institution, before bringing or sending or causing to be brought or sent, any such child into this state, shall first give an indemnity bond in favor of the state of New Jersey in the penal sum of one thousand dollars, to be approved by said commissioner of charities, conditioned as follows: That they will not send or bring, or cause to be brought or sent into this state any child that is incorrigible, or one that is of unsound mind or body; provided, that nothing herein contained shall prevent the importation of blind children under the age of twelve years, subject to all other consistent provisions of this act; that they will at once, upon the placement of any child, report to the commissioner of charities its name and age, and the name and residence of the person with whom it is placed; that if any such child shall, before it reaches the age of twenty-one years, become a public charge, they will, within thirty days after written notice shall have been given them of such fact by the commissioner of charities, remove such child from the state; and if any such dependent child shall be convicted of crime or misdemeanor and imprisoned within three years from the time of its arrival within the state, such person, corporation, association or institution will remove from the state such child immediately upon its being released from such imprisonment, and upon failure, after thirty days' notice and demand to remove as aforesaid, any such child who shall become a public charge as aforesaid, or who shall have been convicted as aforementioned, in either event such person, corporation, association or institution shall, at once and thereby forfeit such sum as the state, or any county or municipality thereof shall have expended in the care, maintenance or prosecution of such child; that they will place or cause to be placed, each of such dependent children under written contract, which will secure to such child a proper home, and will make the person so receiving such child responsible for its proper care, education

and training; that they will properly supervise the care and training of each of such children, and that each of such children shall be visited at least once a year by a responsible agent of the person, corporation, association or institution so placing, or causing to be placed, such child as herein provided; that they will make to the said commissioner of charities such reports of their work as said commissioner of charities from time to time may require.

2. All acts or parts of acts inconsistent herewith are hereby repealed, and this act shall take effect immediately.

Approved March 27, 1912.

Chapter 17, Laws of 1916.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

1. It shall be lawful for the commission for ameliorating the condition of the blind, during each fiscal year, to expend such sum as shall be annually appropriated by the legislature for that purpose, for the practical encouragement, by loans of capital, of stock in trade, or of tools and apparatus, of blind persons desirous of earning a living by any form of business or productive activity. Such payments shall be made upon bills approved by the commission for ameliorating the condition of the blind, upon the warrant of the comptroller, by the treasurer of this state. Said commission is hereby also authorized and empowered to loan any of the moneys provided for pursuant to the provisions of this act and for the amelioration of the blind, and to contract for the repayment of the same, and the moneys when repaid shall form a part of the fund to be kept and maintained by the aforesaid commission, to be used by it pursuant to the provisions of this act.

2. This act shall take effect immediately.

Approved March 3d, 1916.

*A Supplemental to an act entitled "An act constituting a commission for ameliorating the condition of the blind, and defining its powers and duties," approved April sixteenth, nineteen hundred and nine.

Chapter 14, P. L. 1916.

Be it enacted by the Senate and General Assembly of the State of New Jersey:

1. Section one of the act of which this act is amendatory be and the same is hereby amended so that it shall read as follows:

1. That an annual sum, not exceeding three hundred dollars for each pupil, be appropriated out of any moneys in the treasury not otherwise appropriated, to be applied under the direction of the Governor or person administering the government, for the instruction or placing for instruction in some suitable and convenient institution such indigent deaf and dumb, blind or feeble-minded persons, or partially blind, inhabitants of this state, as may be selected under this act; provided, however, that whenever it shall appear that it is necessary for hospital care, instruction and support of blind babies and young children too frail and backward to enter other institutions for the blind, they shall be sent to some suitable and convenient institution in this state having special care of blind babies and children where such hospital care, instruction and support can be provided, and that in all

such cases the rate to be paid by this state for such hospital care, instruction and support shall not exceed the sum of four hundred and fifty dollars per annum, including clothing and the necessary transportation to and from their homes; and provided further, however, that for the instruction and support of any blind child placed in any institution outside of this state the rate to be paid for such instruction and support shall not exceed four hundred dollars per annum, including clothing.

This act shall take effect immediately.

Approved March 16, 1916.

*An act to amend an act entitled "An act for the instruction and maintenance of indigent deaf and dumb, blind and feeble-minded persons, inhabitants of this state," approved March twelfth, one thousand eight hundred and seventy-three.

Law Pertaining to Prevention of Blindness.

Chapter 22, Laws of 1916.

*Be it enacted by the Senate and General Assembly of the state of New Jersey:

1. The commission for ameliorating the condition of the blind, constituted and appointed pursuant to the provisions of the act to which this act is a supplement, are hereby authorized and empowered to make inquiries concerning the causes of blindness, to learn what proportion of the causes of blindness of inhabitants of this state are preventable, and to co-operate with the state board of health and other board, body or official of this state which may be interested in the subject matter of this act, in adopting and enforcing proper and preventive measures. The said commission may expend such sum of money for the purpose of carrying out the provisions of this act as may be appropriated by any annual or supplemental appropriation bill, which said sum, when so appropriated, or any part thereof, shall be paid out of the treasury of this state, on bills duly approved by the commission for ameliorating the condition of the blind in this state.

2. This act shall take effect immediately.

Approved March 7, 1916.

*A supplement to an act entitled "An act constituting a commission for ameliorating the condition of the blind, and defining its powers and duties," approved April sixteenth, nineteen hundred and nine.

NEW MEXICO.

Chapter 22.

An Act for the Compulsory Education of the Blind.

S. B No. 54, as amended, approved March 9, 1915.

Be it enacted by the Legislature of the State of New Mexico:

Sec. 1. Every parent, guardian or person having control or custody of any child who is between the ages of five and twenty-one years, and who, on account of blindness cannot be educated in the public schools, shall send such child to the New Mexico Institute for the Blind at Alamogordo during each school year for the period of seven years, unless such child be taught such branches as are taught in said institute in a private school, at home, or in a similar institute in another state, or unless such child be suffering from physical or men-

tal disability sufficient to incapacitate him or her from attending such institute. It shall be the duty of the superintendent of such institute to see that each pupil in said institution shall have every reasonable opportunity to practice its own religious belief, and that no impediment be placed in the way of such pupils in the practice of their own respective religious belief; provided, that whenever admission to said institute is requested for any child, afflicted with blindness, under five years of age, the board of regents or superintendent thereof is hereby empowered to admit such child, under rules and regulations established by said board.

Sec. 2. That the superintendent of such institute, out of the appropriation made for said institute, shall pay for the transportation of such children to and from such institution whenever the parents, guardian or person having control of such child shall be unable to pay for same; provided, that said board of regents shall prescribe what portion of said appropriation shall be used for said transportation purposes.

Sec. 3. Superintendents of schools in the several counties of the state, on the first day of August and the first day of January in each year, shall furnish the superintendent of the New Mexico Institute for the Blind a complete list of all such children in their respective counties, and it shall be the duty of the superintendent of such institute to communicate to the parent, guardian or person having custody or control of each child the provisions of this act.

Sec. 4. Any person who shall violate this act, upon conviction thereof, shall be punished by a fine of not more than twenty-five dollars or by imprisonment for not more than thirty days. Provided, that this section shall not apply in case the child of any such parent, guardian or other person cannot be admitted to said institute under the rules and regulations thereof.

Sec. 5. It is necessary for the preservation of the public peace and safety of the inhabitants of this state that this act shall become effective immediately; therefore it shall be in full force from any after its passage and approval, if passed by two-thirds of each house, otherwise it shall become effective according to the general provisions of the constitutions.

(These two sheets embody all the laws of this state governing the blind and the blind institutions at this time).

CHAPTER ON STATE INSTITUTIONS.

Para. 5109. Management—Trustees—Qualification and Terms—Powers.

Sec. 92. The management and control of each institutions mentioned in this article, the care and preservation of all property of which they shall become possessed, the erection and construction of all buildings necessary for their use, and the disbursement and expenditure of all moneys appropriated by the State of New Mexico, or which shall otherwise come into their possession, shall be vested in a board of five trustees, one of such boards for each of said institutions. Said trustees shall possess the same qualifications, shall be appointed in the same manner, and their terms of office shall be the same and the vacancies therein shall be filled in the same manner as is provided by law with

reference to the regents of the State University at Albuquerque, New Mexico. Said trustees and their successors in office shall constitute a body corporate, under the name and style of "The Trustees of the New Mexico Asylum for the Deaf and Dumb," "The Trustees for the New Mexico Reform School," "The Trustees of the New Mexico Institute for the Blind" and "The Trustees of the Miners' Hospital of New Mexico," respectively, with the right as such of suing and being sued, of contracting and being contracted with, of making and using a common seal and aftering the same at pleasure, and of causing all things to be done necessary to carry out the provisions of this article. A majority of such board of any of the above institutions shall constitute a quorum for the transaction of business, but a less number may adjourn from time to time. The officers of each of said boards shall be elected in the same manner and possess the same qualifications as the officers of the University of New Mexico now possess; and the secretary and treasurer respectively of each of such institutions located as aforesaid shall each give bond in the sum of ten thousand dollars (\$10,000) to the State of New Mexico, with two or more sufficient sureties resident of this state, or by duly authorized surety company, conditioned for the faithful performance of their duties, and that they will faithfully account for and pay over to the person or persons entitled thereto, at the time and in the manner provided by law, or pursuant to contract, all moneys which shall come into their hands as such officers, which bond shall be approved by the judge of the district court within whose district the said institution is located, and after approval shall be filed and recorded in the office of the Secretary of State. The governor shall be ex-officio a member of each of said boards, but shall not have the right to vote or be eligible to office.

Act of Feb. 12, '03; L. '03, C. 2, Par. 6.

Para. 5110. Board of Trustees—Duties and Powers.

Sec. 93. The boards of each of said institutions shall have power, and it shall be their duty, to pass and enforce by-laws, rules and regulations for the government of such institutions, for the proper carrying out of their several objects, not in conflict with the laws of the State of New Mexico, or any act of congress, and to provide all proper and necessary books, apparatus, instruments, medicines, clothing, food and supplies, and other materials or things necessary for the proper conduct of the several institutions hereinbefore named and the care, support and protection of the inmates thereof when necessary; also to employ all teachers, physicians, wardens or superintendents and employes and to prescribe the duties and compensation of each, and they shall have full power to remove or discharge any officer or employe appointed or selected by them in any of such institutions, when in their judgment the interest of such institution shall require.

NEW MEXICO.

1915.

(Abstract taken from the last United States Census)

Exemption of the Blind.

The commissioners of any community ditch may, if they think it proper, allow blind men or their widows to irrigate free of charge

any portion of their land not to exceed three acres. Such a person must have an interest and water right in the ditch.

NEW YORK.

1867.

An Act to define the objects of the New oYrk State Institution for the Blind, and to provide for its management. Passed April 24th, 1867.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:

Sec. 1. All blind persons of suitable age and capacity for instruction, who are legal residents of the state, shall be entitled to the privileges of the New oYrk Institution for the Blind, without charge, and for such a period of time in each individual case as may be deemed expedient by the board of trustees of said institution; provided that whenever more persons apply for admission at one time than can be properly accommodated in the institution, the trustees shall so apportion the number received, that each county may be represented in the ratio of its blind population to the total population of the state; and provided further that children of citizens who died in the United States service, or from wounds received therein during the late rebellion, shall take precedence over all others.

2. Blind persons from without the state may be received into the institution upon the payment of an adequate sum, fixed by the trustees, for their boarding and instruction; provided that such applicant shall in no case exclude those from the State of New York.

3. Applications for admission into the institution shall be made to the board of trustees, in such manner as they may direct; but the board shall require each application to be accompanied by a certificate from the county judge of the county where the applicant resides, setting forth that the applicant is a legal resident of the town, county and state claimed as his or her residence.

4. The primary object of the institution shall be to furnish to the blind children of the state the best known facilities for acquiring a thorough education, and train them in some useful profession or manual art by means of which they may be enabled to contribute to their own support after leaving the institution; but, it may likewise, through its industrial department, provide such of them with appropriate employment and boarding accommodations as find themselves unable, after completing their course of instruction and training, to procure these elsewhere for themselves. It shall, however, be in no sense an asylum for those who are helpless from age, infirmity or otherwise, or a hospital for the treatment of blindness.

5. Upon the expiration of the term of office of the present board of trustees, the Governor shall, by and with the consent of the Senate, appoint their successors, two of whom shall reside in the county wherein said institution is located, and a majority of whom shall reside within fifty miles of said institution, and at the first meeting of said board, after their appointments aforesaid, they shall divide themselves by lot into three equal classes, who shall serve for two, four and six years, respectively from the date of their appointments, and until their successors shall have been appointed, and every alternate year thereafter the Governor shall, by and with the consent of the Senate, ap-

point three trustees to fill the places of those whose terms of service will have expired in accordance with the provisions of this section.

6. In case of declension of any member of said board of trustees to act under his appointment or of the occurrence of any other casual vacancy in the board, the Governor shall forthwith appoint some suitable person to fill such vacancy, and the member so appointed shall serve out the term of his predecessor.

7. The trustees shall receive no compensation as such, but they may allow themselves mileage at the rate as that paid to members of the legislature, for any distance actually traveled in the service of the institution. Nor shall any trustee be pecuniarily interested in any contract for buildings pertaining to the institution, or in furnishing supplies therefor.

8. The board of trustees shall have charge of all the affairs of the institution, with power to make all necessary bylaws and regulations for their government and the proper management of the institution, as well as for the admission of pupils, and to do all else which may be found necessary for the advancement of its humane design.

9. They shall elect from their own number a president, treasurer and secretary, together with such standing committees as they may deem necessary, and adopt a common seal for the institution.

10. The treasurer shall have the custody of all funds of the institution and pay out the same only upon properly authenticated orders of the board or its executive committee. Before entering upon the duties of his office, he shall execute and file in the office of the Comptroller a bond with such sureties and in such amount of penalty as the Comptroller shall require and approve, conditioned for the faithful discharge of his duties as such treasurer. (As amended by Chapter 154 of the Laws of 1905.)

11. The trustees shall have power to appoint a competent and experienced superintendent, who shall be the chief executive officer of the institution, together with an efficient corps of instructors and other subordinate officers; prescribe the duties and terms of service of the same; fix and pay their salaries and, for just cause, remove any or all of them from office. They shall likewise employ the requisite number of servants and other assistants in the various departments of the institution and pay the wages of same.

12. They shall purchase all furniture, apparatus and other supplies necessary to the equipment and carrying on of the institution in the most efficient manner.

13. When any blind person shall, upon proper application, be admitted into the institution, it shall be the duty of his or her parents, guardians or other friends, to suitably provide such person with clothing at the time of entrance and during continuance therein, and likewise to defray his or her traveling expenses to and from the institution at the time of entrance and discharge, as well as the beginning and close of each session of the school, and at any other time when it shall become necessary to send such person home on account of sickness or other exigency. And whenever it shall be deemed necessary by the trustees to have such person permanently removed from the institution in accordance with the by-laws and regulations thereof, the same shall

be promptly removed upon their order, by his or her parents, guardians or other friends.

14. *Neglect to Provide the Same.* If the friends of any pupil from within the state of New York shall fail through neglect or inability to provide the same with proper clothing or with funds to defray his or her necessary traveling expenses to and from the institution, or to remove him or her therefrom, as required in the preceding section, the trustees shall furnish such clothing, pay such traveling expenses, or remove such pupil to the care of the overseers of the poor of his or her township, and charge the cost of the same to the county to which the pupil belongs, provided that the annual amount of such expenditures on account of any one pupil shall not exceed the sum of sixty dollars. And in the case of the death of any pupil at the institution, whose remains shall not be removed or funeral expenses borne by the friends thereof, the trustees shall defray the necessary burial expenses, and charge the same to his or her county as aforesaid. Upon the completion of their course of training in the industrial department, the trustees may furnish to such worthy poor pupils as may need it, an outfit of machinery and tools for commencing business, at a cost not exceeding seventy-five dollars each, and charge the same to the proper county as aforesaid. (As amended by chapter 463 of the Laws of 1873, 1.)

15. On the first day of October in each year, the trustees shall cause to be made out against the respective counties concerned, itemized accounts, separate in each case, of the expenditures authorized by the preceding section of this act, and forward the same to the board of supervisors chargeable with the account. The board shall thereupon direct the county treasurer to pay the amount so charged to the treasurer of the institution for the blind on or before the first day of March next ensuing.

16. The counties against which the said accounts shall be made out as aforesaid, shall cause their respective treasurers, in the name of their respective counties to collect the same, by legal process if necessary, from the parents or estates of the pupils who have the ability to pay, on whose account the said expenditures shall have been made; provided that at least five hundred dollars' value of the property of such parents or estate shall be exempt from the payment of the accounts aforesaid.

17. The institution shall be entitled to receive copies of all books and other publications which are distributed gratuitously by the state to township or county libraries, common schools, academies, colleges and societies. It may also receive in the name of the state, bequests or donations of money or any kind of property, but such money or property shall in all cases belong to the state, and be subject to its control; provided that the same shall not be diverted from the particular object for which it shall be bequeathed or donated.

18. The board of trustees shall keep full and complete records of their proceedings and make an annual report of the same to the legislature, at the commencement of the regular session thereof, strictly accounting in detail for their expenditures, on account of the institution, during the preceding fiscal year, of the state, setting forth the

progress and condition of the several departments of the institution, making such suggestions concerning its future management as they may deem essential, and submitting proper estimates of the funds needed for its support, as well as for buildings and all other purposes.

19. The state treasurer is hereby directed to pay over to the trustees, upon the warrant of the comptroller, all moneys which shall hereafter be appropriated on account of the New York State Institution for the Blind; general appropriations for the current support of the institution, to be paid in equal quarterly installments, and specific appropriations for building and other purposes, to be paid when needed by the trustees.

20. All drafts upon the state treasury on behalf of the institution shall be based upon order of the board of trustees, signed by the president and secretary of the same and attested by the common seal of the institution.

Chapter 104.

An Act in relation to trustees and directors of charitable and benevolent institutions.

Passed March 12, 1872.

The people of the state of New York, represented in Senate and Assembly, do enact as follows:

Sec. 1. No trustee or director of any charitable or benevolent institution, organized either under the laws of this state or by virtue of a special charter, shall receive, directly or indirectly, any salary or emolument from said institution, nor shall any salary or compensation whatever be voted or allowed by the trustees or directors of any institution organized for charitable or benevolent purposes, to any trustee or director of said institution for services, either as trustee or director, or in any other capacity.

Chapter 616.

An Act to amend chapter seven hundred and forty-four of the Laws of eighteen hundred and sixty-seven, entitled "An act to define the objects of the New York State Institution for the Blind and to provide for its management," passed April twenty-fourth, eighteen hundred and sixty-seven.

Passed May 9, 1872, three-fifths being present.

The people of the state of New York, represented in Senate and Assembly, do enact as follows:

Sec. 1. Section three of chapter seven hundred and forty-four of the Laws of eighteen hundred and sixty-seven, entitled "An act to define the objects of the New York State Institution for the Blind, and to provide for its management," passed April twenty-four, eighteen hundred and sixty-seven, is hereby amended so as to read as follows:

2. Applications for admission into the institution shall be made to the board of trustees in such manner as they may direct, but the board shall require such application to be accompanied by a certificate from county judge or county clerk of the county or the supervisor or town clerk of the town or the mayor of the city where the applicant

resides, setting forth that the applicant is a legal resident of the town, county and state claimed as his or her residence.

. This act shall take effect immediately.

50. *Visitations and Reports by Managers or Trustees.* The board of managers or trustees of each of the state charitable institutions, and of the New York State School for the Blind, in addition to their other duties now required by law shall hold monthly meetings at the institution under its charge and, by a majority of its members, visit and inspect the institution for which it is appointed at least monthly, and shall make a written report to the Governor, the state board of charities and the fiscal supervisor within ten days after each visitation. to be signed by each member making such visitation. Such reports shall include the minutes of the monthly meetings and shall state in detail the condition of the institution visited and of its inmates, and such other matters pertaining to the management and affairs thereof as in the opinion of the board should be brought to the attention of the Governor, the state board of charities or the fiscal supervisor of state charities and may contain recommendations as to needed improvements in the institution or its management. Managers or trustees who fail to attend the meetings of their respective boards or fail to make such visitations for three successive months, shall be deemed to have vacated their membership in such boards of managers or trustees, whereupon the Governor shall fill the vacancies so created as provided by law, unless the absence of such managers or trustees shall be excused by the Governor. The board of managers or trustees of each of the state charitable institutions, the New York State School for the Blind and the reformatories shall also, at each monthly inspection, pass upon all articles abandoned for use during the month and include in its report to the fiscal supervisor a list of such articles showing the action of the board. (As amended by chapter 252 of the Laws of 1902, chapter 473, of the Laws of 1903, chapter 685 of the Laws of 1906, chapter 283 of the Laws of 1907, and chapter 24 of the Laws of 1908.)

50-a. *Appointment and Removal of Managers or Trustees.* Each of the state charitable and reformatory institutions and the State School for the Blind shall be under the control and management of boards of seven managers to be appointed for each institution by the Governor by and with the advice and consent of the Senate. The terms of office of said managers shall be five years and they shall be so appointed that the terms of at least one of the members of each board shall expire on the first Tuesday of February of each year. All vacancies shall be filled by the Governor and the person appointed to fill a vacancy in the board of managers of any institution shall hold office for the remainder of the term of the person whom he succeeds. In the discretion of the Governor persons of either sex may be appointed as managers of such institutions. Such managers shall serve without compensation but shall be entitled to their actual and necessary traveling expenses in attending meetings of the boards of which they are members. The Governor shall have the power to remove any member or members of a board of managers for cause after an opportunity to be heard. Managers and trustees now serving as members of boards which have more than seven members may be continued in office until the expiration

of the term for which they were appointed but no new appointments shall be made to such boards until their membership is reduced to less than seven. Boards now consisting of less than seven members shall be enlarged by additional appointments to be made before the end of the fiscal year. All persons now serving as members of boards of managers or trustees of the state charitable and reformatory institutions shall be eligible to reappointment as managers or trustees at the discretion of the Governor.

Chapter 556, Laws of 1895.

1. The New York State Institution for the Blind as the same was authorized to be established by chapter five hundred and eighty-seven of the laws of eighteen hundred and sixty-five and the acts supplemental thereto shall hereafter be known and designated as the "New York State School for the Blind."

2. This act shall take effect immediately.

THE CONSOLIDATED SCHOOL LAW.

Chapter 556, Laws of 1894.

Article 14.

41. All deaf and dumb persons resident in this state and upwards of twelve years of age, who shall have been resident in this state for one year immediately preceding the application, or, if a minor, whose parents or parent, or, if an orphan, whose nearest friend shall have been resident in this state for one year immediately preceding the application, shall be eligible to appointments as state pupils in one of the deaf and dumb institutions of this state, authorized by law to receive such pupil; and all blind persons of suitable age and similar qualifications shall be eligible to appointment to the Institution for the Blind in the city of New York, or in the village of Batavia, as follows: All such as are residents of the counties of New York, Kings, Queens, Suffolk, Nassau, Richmond, Westchester, Putnam and Rockland shall be sent to the Institution for the Blind in the city of New York. Those who reside in other counties of the state shall be sent to the Institution for the Blind in the village of Batavia. All such appointments, with the exception of those to the Institution for the Blind in the village of Batavia, shall be made by the superintendent of public instruction upon application, and in those cases in which, in his opinion, the parents or guardians of the applicants are able to bear a portion of the expense, he may impose conditions whereby some proportionate share of expense of educating and clothing such pupils shall be paid by their parents, guardians or friends in such manner and at such times as the superintendent shall designate, which conditions he may modify from time to time, if he shall deem it expedient to do so. (As amended by chapter 62 of the Laws of 1903.)

Chapter 201.

An act providing for the drills in the schools of this state. Became a law March 27, 1901, with the approval of the Governor.

Passed, three-fifths being present.

The people of the state of New York, represented in Senate and Assembly, do enact as follows:

Sec. 1. It shall be the duty of the principal or other person in charge of every public or private school or educational institution within the state, having more than one hundred pupils, to instruct and train the pupils by means of drills, so that they may in a sudden emergency be able to leave the school building in the shortest possible time and without confusion or panic. Such drills or rapid dismissals shall be held at least once in each month.

2. Neglect by any principal or other person in charge of any public or private school or educational institution to comply with the provisions of this act shall be a misdemeanor punishable at the discretion of the court by fine not exceeding fifty dollars. Such fine to be paid to pension fund of the local fire department where there is such a fund.

3. It shall be the duty of the board of education or school board or other body having control of the schools in any town or city to cause a copy of this act to be printed in the manual or handbook prepared for the guidance of teachers, where such manual or handbook is in use or may hereafter come into use.

4. The provisions of this act shall not apply to colleges or universities.

5. This act shall take effect June first, nineteen hundred and one.

NEW YORK.

1907.

Article XXXVIII, Section 926.

Education Law.

Employment of Reader for Blind Students. Whenever a blind person, who is a citizen of this state and a pupil in actual attendance at a college, university, technical or professional school located in this state and authorized by law to grant degrees other than an institution established for the regular instruction of the blind, shall be designated by the trustees thereof as a fit person to receive the aid hereinafter provided for, there shall be paid by the state for the use of such pupil the sum of three hundred dollars per annum with which to employ persons to read to such pupil from text book and pamphlets used by such pupil at such college, university or school.

Such money shall be paid annually, after the beginning of the school year of such institution, by the treasurer of the state on the warrant of the comptroller, to the treasurer of such institution, on his presenting an account showing the actual number of blind pupils matriculated and attending the institution, which account shall be verified by the president of the institution and accompanied by his certificate that the trustees have recommended the pupils named in said account as hereinbefore provided. The trustees of any of the said institutions shall recommend no blind person who is not regularly matriculated and who is not in good and regular standing, and who is not working for a degree from the institution in which he is matriculated; and no blind person shall be recommended who is not doing the work regularly prescribed by the institution for the degree for which he is a candidate. The moneys so paid to any such institution shall be disbursed for the purpose aforesaid by and under the direction of its board of trustees.

NEW YORK CITY BILL.
State of New York.

February 5. 1908.

An act to amend the Greater New York charter by providing for an appropriation for the International Sunshine Branch for the Blind of the city of New York.

"To the International Sunshine Branch for the Blind, the sum of one dollar per day for the support, care and instruction of each needy child between the ages of one and eight years that shall be received, entrusted or committed to the said International Sunshine Branch for the Blind; and the number of such children so received, entrusted or committed to the said International Sunshine Branch for the Blind shall be ascertained by the examination and testimony under oath of the president or secretary of the said International Sunshine Branch for the Blind; such payments not to exceed in the aggregate fifteen thousand dollars per annum."

This act shall take effect on the first day of September, nineteen hundred and eight.

NEW YORK.

Chapter 415, Laws 1913, as amended by chapter 363 of the Laws of 1915.

An Act to establish a state commission for improving the condition of the blind of the state of New York, and making an appropriation therefor.

The people of the state of New York, represented in Senate and Assembly, do enact as follows:

Sec. 1. There shall be established a state commission, to be known as the New York state commission for the blind, consisting of five persons to be appointed by the Governor within sixty days after the passage of this act. No person appointed to this commission shall serve thereon while serving as an official of any workshop or school wherein blind people may be placed.

2. The full term of office of the members of this commission shall be five years. But of the first commission appointed, one member shall be appointed for a term of five years, one for a term of four years, one for a term of three years, one for a term of two years and one for a term of one year. At the expiration of the term of any member of the commission, his successor shall be appointed for a term of five years.

3. It shall be the duty of this commission to cause to be maintained a complete register of the blind in the state of New York, which shall describe the condition, cause of blindness, capacity for education and industrial training of each, with such other facts as may seem to the commission to be of value.

4. The commission shall maintain or cause to be maintained one or more bureaus of information and industrial aid, the object of which shall be to aid the blind in finding employment and to teach them trades and occupations which may be followed in their homes, and to assist them in whatever manner may seem advisable to the commission in disposing of the products of their home industry.

5. The commission may establish one or more schools for industrial training and workshops for the employment of suitable blind persons,

and shall be empowered to equip and maintain the same, to pay to employees suitable wages, and to devise means for the sale and distribution of the products thereof. The commission may also pay, during their training for the tuition, temporary lodging and support of pupils or workmen received at any industrial school or workshop established by it or other establishments in which the blind are now or may be hereafter received and instructed, when in its judgment the efficiency of such blind persons will thereby be promoted. The commission may also whenever it thinks proper aid individual blind persons to become self-supporting by furnishing materials or machinery to them; but this shall not be deemed to authorize the making of gifts by the commission.

6. The commission may ameliorate the condition of the blind by promoting visits among them and teaching them in their homes, as the commission may deem advisable.

7. It shall be the duty of this commission to continue to make inquiries concerning the cause of blindness, to learn what proportion of these cases are preventable, and to inaugurate and co-operate in any such preventive measures for the state of New York as may seem wise. The commission may arrange for the examination of the eyes of individual blind or partially blind persons and may obtain and pay for medical and surgical treatment of such persons whenever in the judgment of the commission the eyes of such persons may be benefited thereby.

8. The commission may appoint such officers and agents as may be necessary and fix their compensation within the limits of the annual appropriation, in all cases giving preference to blind persons of equal efficiency, but no person employed by the commission shall be a member thereof. It shall make its own by-laws and shall, annually, on or before the first day of January, make a report to the Governor and the legislature of its proceedings up to and including the thirtieth day of September preceding, embodying therein a properly classified and tabulated statement of its receipts and expenditures. The commission shall make a classified and tabulated statement of its estimate for the year ensuing to the Governor on or before the first day of January in each year. The annual report shall also present a concise review of the work of the commission for the preceding year, with such suggestions and recommendations for improving the condition of the blind and preventing blindness as it may seem expedient.

9. There may be advanced to the chairman of said commission out of the treasury of the state annually, from the amount appropriated for the commission, such sum as may be necessary, not exceeding five thousand dollars at any one time to be used as a working capital for the industries of the commission and for traveling and office expenses. Said sum when drawn from the treasury of the state shall be deposited in a national bank or trust company to the credit of the chairman of the commission as such, who shall give a bond in such sum and with such securities as the comptroller may approve.

10. The commission shall keep separate books of account for its industries, and may use all moneys received from the sale of any products made at its workshops, or from the sale of products made under its supervision to which it has title, for the purpose of carrying

on said industries. The comptroller, or some person authorized by him, shall at least once in each year, and oftener if he deems it advisable, examine the books, accounts and vouchers of the commission.

11. The members of the commission shall receive no compensation for their services, but their traveling and other necessary expenses incurred in the performance of their official duties shall be audited by the comptroller and paid by the treasurer of the state, out of the moneys that may be appropriated therefor.

12. The sum of ten thousand dollars (\$10,000) or so much thereof as may be necessary, is hereby appropriated out of any moneys in the state treasury not otherwise appropriated, for carrying out the objects and purposes of this act, to be paid by the state treasurer upon the warrant of the comptroller to the order of such commission.

13. This act shall take effect immediately.

NEW YORK.

1915.

ACT OF INCORPORATION.

An Act to incorporate the New York Institution for the Blind.

Passed April 21, 1831. Chapter 214, p. 256.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. All such persons as are now, or hereafter may become members of said institution, shall be, and are hereby constituted and appointed a body corporate and politic, in fact and in name, by the style of "The New York Institution for the Blind," for the purpose of instructing children who have been born blind, or who may have become blind by disease or accident, and by that name they and their successors shall and may have succession, and shall be in law capable of suing and being sued, pleading and being impleaded, defending and being defended, in all courts and places whatsoever, in all manner of actions, suits, matters, complaints and causes whatsoever; and that they and their successors may have and use a common seal, and may change and alter the same at their pleasure, and also they and their successors, by the name and style of "The New York Institution for the Blind," shall be capable in law of purchasing, holding and conveying any real and personal estate, for the purposes of their incorporation and none other, which at any time shall not exceed the annual income of ten thousand dollars.

Sec. 2. For the better carrying into effect the objects of the said corporation, there shall be annually elected twenty persons, who shall constitute a board of managers, and have power to conduct and manage all its concerns, the managers to be elected by ballot at an annual meeting of the members of the society, to hold their offices for one year, or until others be elected in their place, the said election to be held at such times and places as the said corporation shall, by their by-laws, from time to time, appoint and direct; the aforesaid managers shall be elected by a majority of the members present at such election, and in case of any vacancy or vacancies in the said board of managers by

death, resignation or otherwise, then the said board shall have power to fill such vacancy or vacancies until the next annual election.

Sec. 3. The board of managers shall, as soon after the annual election as may be convenient, proceed to elect by ballot from among their own number, a president, a vice-president, a treasurer and two secretaries, who shall serve for one year, or until others be elected in their room; and the following persons shall be the first officers and managers, to-wit: Samuel Akerly, president; Herman Averill, vice-president; Curtis Bolton, treasurer; James Donaldson, corresponding secretary; Henry K. Bogert, recording secretary, and Henry Remsen, John R. Stuyvesant, Thompson Price, Morris Ketchum, Sylvanus Miller, William H. Crosby, Gideon Lee, Hiram Ketchum, Samuel Wood, Thomas W. Jenkins, Henry Thomas, Rufus L. Nevins, Joseph D. Beers, Samuel F. Mott, Matthew C. Patterson, shall be the first managers.

Sec. 4. The board of managers so elected as aforesaid, shall have full power to make such by-laws as may, from time to time, be necessary, relative to the management, disposition of the estate and concerns of the said corporation, and regulation of the persons exercising the offices aforesaid, not contrary to law, and may appoint such other agents and servants as may be deemed necessary to transact the business of the said corporation, and designate their duties.

Sec. 5. This act shall continue and be in force until the first day of May, in the year of our Lord one thousand eight hundred and fifty-two; but if the said corporation shall apply any of their funds to any other purposes than those contemplated by this act, then the said corporation shall cease and determine, and the estate real and personal shall be forfeited to, and vested in, the people of this state.

Sec. 6. This act shall be subject to the general provisions and liabilities, contained in the third title of the eighteenth chapter of the first part of the Revised Statutes, and the legislature may at any time hereafter, alter, modify, amend or repeal the same.

An Act to continue in force "An act to incorporate The New York Institution for the Blind"; passed April 21, 1831; passed April 16, 1852.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. The act entitled "An act to incorporate The New York Institution for the Blind," passed April 21, 1831, shall be continued in force from and after the first day of May, one thousand eight hundred and fifty-two.

UNIVERSITY OF THE STATE OF NEW YORK.

Amendment to Charter of

THE NEW YORK INSTITUTION FOR THE BLIND.

This Instrument Witnesseth, That the Regents of the University of the State of New York have amended the charter of The New York Institution for the Blind, incorporated by Chapter 214 of the Laws of 1831, by changing its corporate name to that of

THE NEW YORK INSTITUTE FOR THE EDUCATION OF THE
BLIND.

Granted August 29, 1912, by the Regents of the University
of the State of New York, executed under their seal and
(SEAL.) recorded in their office.

Number 2284.

(Signed) A. S. DRAPER,
Commissioner of Education.

(Signed)
ST. CLAIR McKELWAY,
Vice-Chancellor.

NEW YORK STATE.

Chapter 60.

An Act to amend the education law, relative to the kindergarten
training and instruction of blind babies and children.

Became a law March 22, 1912, with the approval of the Governor.

Passed, three-fifths being present.

To the People of the State of New York, represented in Senate and
Assembly, do enact as follows:

Section 1. Section nine hundred and seventy-two of chapter twenty-
one of the laws of nineteen hundred and nine, entitled "An act relating
to education, constituting chapter sixteen of the consolidated laws,"
as amended by chapter one hundred and forty of the laws of nineteen
hundred and ten, is hereby amended to read as follows:

§972. Persons eligible as pupils to institutions for instruction of the
blind. All blind persons of suitable age and possessing the other
qualifications prescribed for deaf and dumb state pupils under section
nine hundred and twenty-one shall be eligible to appointment to the
institutions for the blind in the City of New York, or in the village
of Batavia, as follows:

1. All such as are residents of the counties of New York, Kings,
Queens, Nassau, Richmond, Westchester, Putnam and Rockland, shall
be sent to the institution for the blind in the city of New York.

2. All such who reside in other counties of the state shall be sent
to the institution for the blind in the village of Batavia. Blind
babies and children, not residing in the city of New York, of the age
of twelve years and under and possessing the other qualifications
prescribed in the preceding section of this chapter and requiring
kindergarten training and instruction shall be eligible to appoint-
ment as state pupils in one of the homes for blind babies and children
maintained by the International Sunshine Society, Brooklyn Home for
the Blind, Crippled and Defective Children, and the Catholic Institute
for the Blind, and any such child may be transferred to the institution
for the blind in the city of New York or the village of Batavia, to
which he or she would otherwise be eligible to appointment, upon
arriving at suitable age, in the discretion of the commissioner of edu-
cation. All such appointments, with the exception of those to the
institution for the blind in the village of Batavia, shall be made by
the commissioner of education upon application, and in those cases
in which, in his opinion, the parents or guardians of the applicants
are able to bear a portion of the expense, he may impose conditions

whereby some proportionate share of expense of educating and clothing such pupils shall be paid by their parents, guardians or friends, in such manner and at such times as the commissioner may designate, which conditions he may modify from time to time, if he shall deem it expedient to do so.

§2. Subdivision two of section nine hundred and seventy-three of said chapter, as amended by chapter one hundred and forty of the laws of nineteen hundred and ten, is hereby amended so as to read as follows:

2. The regular term of instruction for such pupils, upwards of twelve years of age, shall be five years; but the commissioner of education may, in his discretion, extend the term of any pupil for a period not exceeding three years. The term of kindergarten training and instruction for babies and children of the age of twelve years and under received into any such institution under the provisions of section nine hundred and seventy-two of this chapter, shall be at the discretion of the commissioner of education and shall be paid for at the rate of one dollar per day. The pupils provided for in this section and sections nine hundred and seventy-one and nine hundred and seventy-two of this article shall be designated state pupils; and all the existing provisions of law applicable to state pupils now in said institutions shall apply to pupils herein provided for.

§3. This act shall take effect immediately.

NEW YORK.

ARTICLE 38.

INSTRUCTION OF DEAF MUTES AND THE BLIND.

970. *Duties of Commissioner of Education.* All the institutions for the instruction of the deaf and dumb, and blind, and all other similar institutions, incorporated under the laws of the state, or that may be hereafter incorporated, shall be subject to the visitation of the commissioner of education, and it shall be his duty:

1. To inquire into the organization of the several schools and the method of instruction employed therein.

2. To prescribe courses of study and methods of instruction that will meet the requirements of the state for the education of state pupils.

3. To make appointments of pupils to the several schools, to transfer such pupils from one school to another as circumstances may require; to cancel appointments for sufficient reason.

4. To ascertain by a comparison with other similar institutions, whether any improvements in instruction and discipline can be made; and for that purpose to appoint from time to time, suitable persons to visit the schools.

5. To suggest to the directors of such institutions and to the legislature such improvements as he shall judge expedient.

6. To make an annual report to the legislature on all the matters before enumerated, and particularly as to the condition of the schools, the improvement of the pupils, and their treatment in respect to board and lodging.

971. *Persons eligible as pupils to institutions for instruction of the*

deaf and dumb. All deaf and dumb persons resident in this state and upwards of twelve years of age, who shall have been resident in this state for one year immediately preceding the application, or, if a minor, whose parent or parents, or, if an orphan, whose nearest friend shall have been a resident of this state for one year immediately preceding the application, shall be eligible to appointment as state pupils in one of the deaf and dumb institutions of this state, authorized by law to receive such pupils.

972. *Persons eligible as pupils to institutions for instruction of the blind.* All blind persons of suitable age and possessing the other qualifications prescribed for deaf and dumb state pupils under section nine hundred and twenty-one (misprint for 971) shall be eligible to appointment to the institutions for the blind in the city of New York, or in the village of Batavia, as follows:

1. All such as are residents of the counties of New York, Kings, Queens, Suffolk, Nassau, Richmond, Westchester, Putnam and Rockland, shall be sent to the institution for the blind in the city of New York.

2. All such who reside in other counties of the state shall be sent to the institution for the blind in the village of Batavia. Blind babies and children, not residing in the city of New York, of the age of twelve years and under and possessing the other qualifications prescribed in the preceding section of this chapter and requiring kindergarten training and instruction shall be eligible to appointment as state pupils in one of the homes for blind babies and children maintained by the International Sunshine Society, Brooklyn Home for the Blind, Crippled and Defective Children, and the Catholic Institute for the Blind, and any such child may be transferred to the institution for the blind in the city of New York or village of Batavia, to which he or she would otherwise be eligible to appointment, upon arriving at suitable age, in the discretion of the commissioner of education. All such appointments, with the exception of those to the institution for the blind in the village of Batavia, shall be made by the commissioner of education upon application, and in those cases in which, in his opinion, the parents or guardians of the applicants are able to bear a portion of the expense, he may impose conditions whereby some proportionate share of expense of education and clothing such pupils shall be paid by their parents, guardians or friends, in such manner and at such times as the commissioner shall designate, which conditions he may modify from time to time if he shall deem it expedient to do so.

973. *Support and term of instruction of state pupils.* 1. Each pupil so received into any of the state institutions aforesaid shall be provided with board, lodging and tuition; and the directors of the institution shall receive an annual appropriation for each pupil so provided for, in quarterly payments, to be paid by the treasurer of the state, on the warrant of the comptroller, to the treasurer of said institution, on his presenting a bill showing the actual time and number of such pupils attending the institution, which bill shall be signed by the president and secretary of the institution, and verified by their oaths.

2. The regular term of instruction for such pupils, upwards of twelve years of age, shall be five years; but the commissioner of education may, in his discretion, extend the term of any pupil for a period not exceeding three years. The term of kindergarten training and instruction for babies and children of the age of twelve years and under received into any such institution under the provisions of section nine hundred and seventy-two of this chapter, shall be at the discretion of the commissioner of education and shall be paid for at the rate of one dollar per day. The pupils provided for in this section and sections nine hundred and seventy-one and nine hundred and seventy-two of this article shall be designated state pupils; and all the existing provisions of law applicable to state pupils now in said institutions shall apply to pupils herein provided for.

974. *Regulations for admission.* The commissioner of education may make such regulations and give such directions to parents and guardians, in relation to the admission of pupils into either of the above-named institutions, as will prevent pupils entering the same at irregular periods.

975. *Clothing for state pupils.* * * * * *

976. *Aid for blind and deaf students.* 1. Whenever a blind or deaf person, who is a citizen of this state and a pupil in actual attendance at a college, university, technical or professional school located in this state and authorized by law to grant degrees, other than an institution established for the regular instruction of the blind or deaf, shall be designated by the trustees thereof as a fit person to receive the aid hereinafter provided for, there shall be paid by the state for the use of such pupil the sum of three hundred dollars per annum with which to employ persons to read to such blind pupil from textbooks and pamphlets used by such pupil in his studies at such college, university, or school, or to aid a deaf student in receiving instruction in such studies.

2. Such money shall be paid annually, after the beginning of the school year of such institution, by the treasurer of the state on the warrant of the comptroller, to the treasurer of such institution, on his presenting an account showing the actual number of blind or deaf pupils matriculated and attending the institution, which account shall be verified by the president of the institution and accompanied by his certificate that the trustees have recommended the pupils named in said account as hereinbefore provided.

3. The trustees of any of the said institutions shall recommend no blind or deaf person, who is not regularly matriculated, and who is not in good and regular standing, and who is not working for a degree from the institution in which he is matriculated; and no blind or deaf person shall be recommended who is not doing the work regularly prescribed by the institution for the degree for which he is a candidate. The moneys so paid to any such institution shall be disbursed for the purposes aforesaid by and under the direction of its board of trustees.

NEW YORK.

(Abstract taken from the last United States Census.)
School for the Blind.

1910.

The supervisors of any county from which state pupils are received in the New York institution for the blind, whose parents or guardians are unable to furnish them with suitable clothing, are authorized to appropriate \$30 yearly for each such pupil and to pay the sum to the institution to be applied by it to furnishing the pupil suitable clothing. The supervisors of any county other than New York, Kings, Queens, Nassau and Suffolk from whose pauper institutions pupils are sent to the institution for the blind must pay toward the expense of educating and clothing such pupils a sum equal to that which the county would have to pay to support the pupils as paupers at home. The supervisors or officers corresponding to them of the counties of New York, Kings, Queens, Nassau and Suffolk are directed to pay \$50 instead of the \$30 previously mentioned.

Compulsory Education.

1911.

The law relating to the compulsory education of children applies to blind children, except those that receive appointments to special schools for the blind.

Relief of the Needy Blind.

The commissioner of public charities of New York City is authorized to insert in his annual estimate of expenditure for the relief of the poor adult blind not to exceed \$150,000. The commissioner must distribute the sum so appropriated each year in uniform sums not to exceed \$100 to each person, to such adult blind persons not inmates of any of the public or private institutions in New York City who are in need of relief and who are citizens of the United States, and have date of application for relief. (Laws 1913.)

In any city of the first class having a population of over 1,000,000 inhabitants, the mayor may issue a license to any adult blind person for the vending of goods or newspapers, or the playing of musical instruments, on such public thoroughfares and in such places as the license may designate and upon conditions prescribed by it. Such a license is issued for one year without charge, and only to a person who is a citizen of the United States and has resided for three years consecutively in the city. (Laws 1909.)

NORTH CAROLINA.

1917.

STATE SCHOOL FOR THE BLIND AND DEAF.

The institution for the education of the deaf, dumb and the blind located in the city of Raleigh, on Caswell square, and on a lot located in the eastern part of the city, belonging to the state, and on which the institution for the colored children is located, shall be a corporation under the name and style of The State School for the Blind and the Deaf, and shall be under the management of a board of directors and superintendents.

The governor shall, by and with the consent of the senate, appoint eleven directors for said institution. The directors shall be divided into three classes. The first two classes shall consist of four each and the other class shall consist of three. The first class shall be appointed in one thousand nine hundred and five and every six years thereafter; the second class in one thousand nine hundred and seven, and every six years thereafter; the third class in one thousand nine hundred and nine, and every six years thereafter. They shall hold their offices until their successors are elected and qualified, and the term of office shall begin the first day of March of the respective years. The governor shall fill all vacancies occurring by reason of death, resignation or otherwise. In case of vacancies occurring when the senate is not in session the appointees to fill such vacancies shall hold office until confirmed or rejected by the senate.

The board of directors shall organize by electing one of its number president and three an executive committee. The terms of office in each case shall be for two years. The board shall elect a superintendent, whose term of office shall be for three years; also a steward and physician whose term of office shall be for two years, and such other officers, agents and teachers as shall be deemed necessary. The compensation for officers and agents and teachers, mentioned in this section, shall be fixed by the board, and shall not be increased nor reduced during their term of service. The board shall have power to erect any buildings necessary, make improvements, or in general do all matters and things which may be beneficial to the good government of the institution, and to this end may make by-laws for the government of the same.

The board shall meet at stated times and also at such other times as it may deem necessary. The members of the board shall serve without reward, save their traveling expenses incurred in the discharge of their official duties.

The board of directors shall, on application, receive in the institution for the purpose of education, in the main department, all white blind children, and in the department for the colored all colored deaf mutes and blind children, residents of this state, not of confirmed immoral character, nor imbecile, or unsound in mind or incapacitated by physical infirmity for useful instruction, who are between the ages of seven and twenty-one years: Provided, that application shall be made and applicants received at stated times, which shall be at the commencement of some scholastic year.

The directors of the institutions for the blind, in the city of Raleigh, shall set apart two rooms in said institution, one for males and one for females, for the use of the curable blind who, by reason of poverty, are unable to pay for treatment. It shall be the duty of the directors of the institutions for the blind in Raleigh to admit into such institutions, from time to time, such of the blind of the state as they may deem to be curable.

The board may, upon the recommendation of the superintendent and faculty, confer such degrees or marks of literary distinction as may be thought best to encourage merit.

The board of directors shall, on the second Monday in May, one

thousand nine hundred and five, and every three years thereafter, elect an officer to be styled superintendent. They may elect all officers and teachers at the same time: Provided, that the terms of office of the superintendent and steward shall begin June first, and the terms of all other officers and teachers shall begin September first, and for the terms named in this chapter. The superintendent shall be a man of good moral character, and shall have experience as a teacher in the deaf, dumb and blind school of North Carolina, or some similar institution, for the term of two or more years. He shall have charge of the institution in all its departments, and shall do and perform such duties and exercise such supervision as is incumbent upon such officer.

The state treasurer shall be *ex officio* treasurer of the institution. He shall report to the board at such times as they may call on him, showing the amount received on account of the institution, amount paid out, and amount on hand. The board shall make a report to the governor on the first January next before the regular meeting of the general assembly, showing the condition of the institution in its various departments, and shall give any information the governor shall desire from time to time.

The board shall have power to remove any officer, employee or teacher for gross immorality, wilful neglect of duty, or any good and sufficient cause; but in any such case notice in writing of the charges shall be served on the accused, proved and entered on record. The board shall fill all vacancies which may occur from any cause.

The superintendent, subject to the control of the board, shall have power to employ all employees and fix their compensation, and to discharge them at pleasure.

Where it shall appear to the satisfaction of the governor, upon the affidavit of two respectable citizens, that the parents of any deaf mute or blind child are unable to provide said child with clothing and for expenses to and from the institution, or where the child has no living parents or estate of its own, then the governor shall draw upon the auditor for an amount sufficient to clothe him and pay said expenses, and the auditor, upon the state treasurer, who shall pay the same: Provided, the auditor shall charge said amount to the county from which said child came and add it to the tax list of the sheriff of said county and collect the same as other amounts due the state: Provided further, the amount charged shall in no case exceed thirty dollars per year for any pupil.

AN ACT TO COMPEL BLIND CHILDREN TO ATTEND SCHOOL.

The General Assembly of North Carolina do enact:

Section 1. That every blind child of sound mind and body living in the State of North Carolina shall attend the State School for the Blind and Deaf, at Raleigh, or some similar school for the education of the blind, for a term of nine months each year, between the ages of seven and seventeen years. The term "blind child" is to be construed as meaning any child whose sight is so defective as to make it impracticable to obtain an education in school for the seeing.

Sec. 2. That parents, guardians or custodians of any blind child

or children between the ages of seven and seventeen years shall send or cause to be sent such child or children to some school for the instruction of the blind at least eight sessions of nine months each.

Sec. 3. That parents, guardians or custodians of any blind child or children between the ages of seven and seventeen years, failing to send such child or children to some school for the instruction of the blind, shall be guilty of a misdemeanor, and upon conviction shall be fined or imprisoned, at the discretion of the court, for each year that said child or children shall be kept out of school between the ages specified: Provided, that this section shall not be enforced against the parents, guardians or custodians of any blind child until such time as the authorities of some school for the instruction of the blind shall serve written notice on such parents, guardians or custodians, directing that such child be sent to the school whereof they have charge: Provided further, that the authorities of the said State School for the Blind and Deaf shall not be compelled to retain in their custody or under instruction any incorrigible person, or person of confirmed immoral habits.

Sec. 4. That it shall be the duty of the school census taker to report name, age and sex of each blind child in his district, and names of parents, guardians or custodians and their postoffice addresses, to the county superintendent of education, who shall send report of names and addresses to the superintendent of the State School for the Blind and Deaf at Raleigh, N. C. That said census taker or county superintendent failing to make report as provided in this act shall be fined five dollars (\$5) for each blind child not so reported.

Sec. 5. That said fine as provided in section three (3) of this act, and said fine of five dollars (\$5) provided in section four (4) of this act, when collected, shall be paid to the public school fund of the county in which such child lives.

Sec. 6. The sheriffs of the various counties of the state of North Carolina shall be required to enforce the provisions of this act in all cases of blind children not attending other institutions for the blind reported to them by the superintendent of the said State School for the Blind and the Deaf; that said sheriffs shall have authority to reimburse themselves for such services and expenses as are entailed upon them in executing the provisions of this act. And further, in order to aid the superintendent of the said school for the blind and the deaf in securing the attendance of blind children upon the said school, that the various railroads operating in the state of North Carolina may grant him transportation without charge.

Sec. 7. That this act shall take effect and be in force from and after the first day of September, one thousand nine hundred and eight.

In the General Assembly read three times and ratified this the 1st day of February, A. D. 1908.

1003.

1. H. B. 1779. S. B. 1585.

An act supplemental to an act authorizing the issue of bonds of the state for permanent enlargement and improvements of the state's educational and charitable institutions.

Whereas, in the bill authorizing the issuing of three million dollars

of bonds for the enlargement and improvement of the state's educational and charitable institutions of the state, no provision is made for the construction and equipment of buildings on the eighty acre tract of land purchased by the state for the blind institution, and no appropriation made for the permanent improvement of said institution;

Now therefore, for the purpose of making provision for the construction and equipment of said buildings the permanent improvements for said institution;

The General Assembly of North Carolina do enact:

Section 1. That there be and is hereby appropriated out of the general funds of the treasury of the state of North Carolina, not otherwise appropriated, the sum of one hundred and fifty thousand dollars (\$150,000,000) to be applied in the construction and equipment of buildings on the eighty acre tract of land purchased by the state for the Institution of the Blind at Raleigh.

Sec. 2. That the construction and equipment of said buildings shall be under the authority and supervision of the state building commission, referred to in section seven of said bill.

Sec. 3. That the appropriation herein made shall not interfere with other appropriations made by this General Assembly: Provided, that if the income of the state be insufficient to meet all appropriations the treasurer of the state is hereby authorized and directed to borrow sufficient funds to meet the appropriations provided for in section one of this act.

Sec. 4. This act shall be in force from and after its ratification.

In the General Assembly read three times and ratified, this the 6th day of March, 1917.

O. MAX GARDNER,
President of the Senate.
WALTER MURPHY.

Speaker of the House of Representatives.

Examined and found correct.

PHILLIPS.

For Committee.

NORTH CAROLINA.

1908.

(Abstract taken from the last United States Census.)

Investigation of Blindness.

The board of public charities, consisting of five electors elected by the general assembly and holding office for two years, are charged with the duty of investigating the causes of "defect or loss of the several senses," and thus being able to give data to the general assembly to guide them in legislation and "to contribute to enlighten public opinion." The members of the board receive no compensation other than their expenses.

The board of commissioners of each county must annually report to the board of public charities the number of blind of their county not in a hospital or school and such other information as may be desirable to get a complete view of the number and condition of this class of persons in the state. The board of charities must prepare and

furnish to the commissioners of each county carefully arranged circulars indicating the information desired. The board of commissioners in aid of this purpose may require the justices of the peace of each township to prepare and furnish them with the information called for.

NORTH DAKOTA.

Passed Bill No. 67 of the Session Laws of 1913.

For an act to provide for the care, maintenance and instructions of blind babies and children under school age.

Be it enacted by the Legislative Assembly of the State of North Dakota:

Section 1. The board of control of state institutions shall have power to provide in the North Dakota Blind Asylum or any other institution that can give proper care and education for the suitable care, maintenance and instruction of babies and children under school age, residing in this state, who may be born blind, or become blind.

2. For the purpose of providing such care and maintenance and education the said board of control shall have power to furnish all necessary attendants and facilities for the suitable care, maintenance and education of such blind babies and children under school age in the North Dakota Blind Asylum or any other properly equipped institutions and to provide for the transportation of such blind babies and children under school age from their place of residence to such institutions.

3. (Emergency.) Whereas, an emergency exists in that there is now no law in this state for the admission of blind babies or children under school age into the North Dakota Blind Asylum or any other institution, therefore this act shall be in full force and effect from and after its passage and approval at the rate of one dollar a day for care, nursing and education.

NORTH DAKOTA.

1913.

(Abstract taken from the last United States Census.)

School for the Blind.

The general management and control of the North Dakota Blind Asylum is vested in the board of control of state institutions. The board makes all rules and regulations governing the school and provides employment and instruction for its inmates.

Compulsory Education.

Every parent, guardian or other person having charge or control of any blind person between the ages of 7 and 21 years must send him to the state school for the blind for the entire school year, unless excused by the superintendent of the school. The board of education of the city or village or school board of the district may excuse the person having control of such blind person from this duty, when he can satisfactorily show that the person is being taught in another institution approved by the county school superintendent, or that such person is actually necessary to the support of the family, or that he has already acquired the branches of learning taught in the public schools, or that he is physically or mentally incapable of attending school. Failure to comply with these provisions constitutes a misdemeanor.

In connection with the school census an enumeration is made of the names, ages and addresses of all blind persons between the ages of 5 and 25 years, a copy of which is sent to the superintendent of the school for the blind.

OHIO.

1908.

An Act to establish a commission for improving the condition of the blind.

Be it enacted by the General Assembly of the State of Ohio:

Section 1. There shall be a state board to be known as the Ohio Commission for the Blind, consisting of six persons, five of whom shall be appointed by the Governor within sixty days after the passage of this bill, and the sixth member shall be the superintendent of the State School for the Blind at Columbus.

Sec. 2. The term of office of the commissioners shall be five years, except that, of the first commission appointed, one member shall be appointed for one year, one member for two years, one member for three years, one member for four years, and one member for five years. At the conclusion of the term of each, his successor shall be appointed for a full term of five years.

Sec. 3. The commission shall, within thirty days of its appointment, hold its first meeting, elect one of its members as president, who shall preside at its meetings, and who shall have power to call meetings when it shall be deemed advisable.

Sec. 4. It shall be the duty of the commission to prepare and maintain a complete register of the blind in the State of Ohio, which shall describe the condition, cause of blindness, capacity for educational and industrial training of each, together with such other facts as may seem to the commission to be of value.

Sec. 5. The commission shall act as a bureau of information and industrial aid, the object of which shall be to aid the blind in finding employment, and to teach them industries which may be followed in their homes.

Sec. 6. The commission may establish schools for industrial training and workshops for the employment of suitable blind persons, and shall be empowered to equip and maintain the same, to pay the employes suitable wages and to devise means for the sale and distribution of the products thereof. The board may also provide or pay for, during their training, temporary lodging and support for pupils or workmen received at any industrial schools and workshops established by it.

Sec. 7. As soon as the said schools and workshops are established and in successful operation, the industrial department for adult blind of the State Institution for the Blind at Columbus, as provided in Section 667 of the Revised Statutes of Ohio, shall be discontinued.

Sec. 8. The commission may ameliorate the condition of the aged or helpless blind by promoting visits to them in their homes for the purpose of instruction, and by such other lawful methods as may seem to the commission to be expedient.

Sec. 9. The commission may appoint such officers and agents as may be necessary and fix their compensation within the limits of the annual appropriation; but no person so appointed shall be a member. The

commission shall make its own by-laws, and shall prepare an annual report to the Governor and the Legislature of its proceedings for each fiscal year, embodying therein a properly classified and tabulated statement of its estimates for the ensuing year, with its own opinion as to the necessity or expediency of appropriations in accordance with said estimate. The annual report shall also present a concise review of the work of the commission for the preceding year, with such suggestions and recommendations for improving the condition of the blind as may be expedient. The supervisor of public printing shall print two thousand (2,000) copies of this annual report for the use of the commission.

Sec. 10. It shall be the duty of the commission, in making inquiries concerning the cause of blindness, to learn what proportion of these cases are preventable, and to co-operate with the state board of health in adopting and enforcing proper preventive measures.

Sec. 11. The members of the commission shall receive no compensation for their services, but their traveling and other necessary expenses, when approved by the president of the commission, incurred in the performance of their official duties, shall be paid by the treasurer upon an order from the auditor of state.

Sec. 12. Authority is hereby given the commission to use, in the furtherance of the purpose of this act, any receipts or earnings that may accrue from the operation of industrial schools and workshops, as provided in section six of this bill, provided that a detailed statement of receipts or earnings and expenditures be made monthly to the auditor of state.

Approved May 9, 1908.

OHIO.
1913.

Law providing for state maintenance of day schools for the blind.

An act to amend sections 7755, 7756, 7757, 7758, 7759, 7760, 7761 for the establishment of public schools for the deaf, blind and crippled.

Be it enacted by the General Assembly of the State of Ohio:

Section 1. That sections 7755, 7756, 7757, 7758, 7759, 7760 and 7761 of the General Code be amended to read as follows:

Sec. 7755. Upon application by a board of education of any school district in Ohio to the superintendent of public instruction he shall grant permission to such board and it may thereupon establish and maintain within its limits one or more day schools at an average attendance of not less than three pupils for the instruction of deaf persons, residents of this state, over the age of three, for the instruction of blind persons, residents of this state, over the age of four, and of crippled persons, residents of this state, over the age of five.

Sec. 7756. A board of education, which maintains one or more day schools for the instruction of the deaf, blind or crippled persons shall report to the superintendent of public instruction annually, and as often as such commissioner directs such facts concerning such school or schools as he requires.

Sec. 7757. At the close of each school year each board of education of the school district in which such schools for the education of the deaf, crippled or blind shall be established and maintained, shall certify

to the auditor of state the number of pupils given instruction in said schools during the preceding school year and thereupon the auditor of state shall draw his warrant upon the treasurer of state in favor of such board of education, payable out of the general fund in an amount equal to \$150.00 for each deaf or crippled pupil given instruction in such schools within said district for nine months during said school year, and a proportionate amount for each deaf or crippled pupil given instruction therein for a part of said school year less than nine months, and the sum of \$200 for each blind pupil given instruction in such schools within such district for nine months during said school year, and a proportionate amount for each blind pupil given instruction therein for a part of said school year less than nine months.

Sec. 7758. The sums provided in the next preceding section shall be paid by such state treasurer upon the presentation of such warrant or order upon satisfactory proof made to him by the president or clerk of the board of education maintaining such school, of the number of pupils instructed therein, their residence, and the period of time such pupils were so instructed in such schools the preceding school year.

Sec. 7759. Teachers in such schools shall be appointed and employed as are other public school teachers. They shall possess the usual qualifications required of teachers in the public schools, and in addition thereto such special training and equipment as the board of education may require. The so-called oral system shall be taught by such teachers in schools for the deaf. If, after a fair trial of nine months, any of such children in any school for the deaf for any reason is unable to learn such method, then they may be taught the manual method in a separate school, provided, however, that there are not fewer pupils than provided in Sec. 7755 of the General Code.

Sec. 7760. For the purpose hereof, any person of sound mind who, by reason of defective hearing, or defective vision, or so crippled as to be physically unable to care for himself without assistance, cannot profitably be educated in the public schools as other children, shall be considered as deaf, blind or crippled and after the establishment of any such school by any school district, may be compelled to attend such school or a state institution.

Sec. 7761. The state school commissioner shall select some competent person to inspect all such day schools established by virtue of this act, and cause inspection to be made at least twice a year concerning the methods of instruction, the condition of the buildings in which the same are held, the conditions under which said schools are maintained, and such other matters as may be of interest in the education of such children in such schools; and such persons so appointed shall make a full report thereof in writing to the state commissioner of schools at the close of each school year.

Sec. 2. That said original sections 7755, 7756, 7757, 7758, 7759, 7760 and 7761 of the General Code be, and the same are hereby repealed.

Approved May 2, 1913.

OHIO.

1913.

Pension Law.

An act to create an institution for the relief of the needy blind.

Be it enacted by the General Assembly of the State of Ohio:

Section 1. That there shall be established and maintained in the city of Columbus, Ohio, a state institution, to mean under this act a board of relief and benefit of the needy blind.

Sec. 2. That said institution shall consist of a board of three members appointed by the Governor, one for four years, one for three years, one for two years, and all appointments thereafter shall be for a term of four years, and all vacancies shall be filled by the Governor for any unexpired term; the said board shall have the control and management of its finances and shall have the power to enact all necessary rules and regulations.

Sec. 3. The said board shall meet at the call of the governor or its president or at such time as may be agreed upon by its members, and shall be authorized to employ a secretary at a salary not to exceed twelve hundred dollars per annum.

Sec. 4. Said board shall provide suitable rooms, furniture and supplies for its use and may hold its sessions outside of the said city, at any place within the state. The members of the board shall serve without compensation but they shall receive the necessary expenses of travel.

Sec. 5. Any person who becomes blind residing in this state and who has continuously resided in this state for five years prior to his application for the relief herein provided, who, by reason of loss of eyesight, is unable to provide himself or herself with the necessities of life and has not sufficient means of his or her own so to do, shall be deemed entitled to the benefits and support of the said institution as herein provided.

Sec. 6. In order to obtain relief from the said institution for the blind, the persons claiming relief shall file written application with the probate judge of the county in which he or she resides, duly verified and supported by the sworn statements of at least two reputable residents of the county where the applicant resides, one of whom shall be a registered physician, and neither of whom shall be related to the applicant, setting out the facts entitling the person to the relief as claimed.

Sec. 7. The probate judge of the county in which said application is filed shall promptly hear and determine the said evidence or such other and further evidence as he may require, and shall thereupon determine the amount of the relief that the applicant is entitled to under said proof, not exceeding the sum of two hundred and forty dollars per annum, payable quarterly, and shall immediately, upon his finding transmit a copy of the said application and evidence and finding to the said board, and his findings upon said facts shall be final and conclusive unless reviewed, set aside or modified by the board at their discretion.

Sec. 8. In addition to the taxes levied by law for its purposes, the said board may certify to the said auditor of state, to be levied and

collected as other taxes, a state tax not to exceed one-sixth of one mill on the dollar, to be levied and collected upon the taxable property of the state for the purpose of creating a fund for the blind as herein provided. Provided, however, that such levy shall be subject to the limitations provided by law upon the maximum and combined maximum rates of taxation. After the passage of this act and on the demand of the state treasurer the treasurers of the respective counties shall transfer and pay over to the state treasurer all monies in their possession or that may thereafter come into their possession under present levies for the relief of the blind.

Sec. 9. Out of the funds so received the said board shall quarterly issue to the claimant the sum allowed for the previous quarter and the warrant for the said sum shall be signed by the president and secretary of said board and be approved by the auditor of state.

Sec. 10. That sections 2962, 2963, 2964, 2965, 2966, 2967, 2967-1, 2968, 2969 and 2970 of the General Code be, and the same are hereby repealed.

Approved May 9, 1913.

Law to Provide Readers for College Students.

An act to supplement section 1885 of the General Code, providing for additional educational opportunities for the blind.

Be it enacted by the General Assembly of the State of Ohio:

Section 1. That section 1885 of the General Code be supplemented by the addition of section 1885-1, as follows:

Sec. 1885-1. Subject to the approval of the Ohio Board of Administration, the superintendent may provide for the further and higher education of any pupils who in his judgment are capable of receiving sufficient benefit thereby to render them more efficient as citizens by appointing readers for such persons to read from text-books and pamphlets used in their studies while in attendance as regularly matriculated students in any college, university, technical or professional school located in this state and authorized by law to grant degrees.

Approved May 5, 1913.

OHIO.

(Abstract taken from the last United States Census.)

School for the Blind.
1911.

The state school for the blind, as well as all other penal, correctional and benevolent institutions of the state, is governed by the Ohio board of administration, which is composed of four persons appointed by the Governor with the consent of the senate, not more than two of whom may belong to the same political party. The members serve for four years, and each receives a salary of \$5,000 a year, as well as expenses. Blind and purblind residents of the state over 8 years of age, or in exceptional cases over 6 years of age, judged to be of suitable mental capacity to receive the instruction provided, may be admitted to the school. Pupils admitted under 14 years of age may remain until the age of 21; if over 14 and under 21 years of age, they may remain seven years. Subject to the approval of the board of administration the superintendent may permit former students to return to

the institution for a period not exceeding one year to review or perfect their studies, but not at an age beyond the oldest period provided above. Nonresidents may be admitted as pupils, if there is accommodation for them, upon payment of the sums determined by the board of administration. The board may expend not more than \$600 a year for the purchase of books, maps and other educational appliances from the American Printing House for the Blind for the use of the institution and gratuitous distribution among the indigent blind of the state, if the purchase can be made at a price not exceeding the cost of their production.¹

Deaf and blind persons are admitted to the state school for the deaf, or the board of administration may provide for the education of a deaf and blind child at its home.

Census of the Blind.

1910.

In connection with the school census there is an annual enumeration of blind children between the ages of 6 and 21 years. Quadrennially, at the time of taking a list of property for taxation, an enumeration is made by each assessor of all blind persons in his township or precinct and the returns are filed with the county auditor.

Compulsory Education.

1910.

Education is compulsory for persons entitled to enter either the state school for the blind or the state school for the deaf, and the truancy laws in general apply to them.

¹The General Code of 1810 contains the following provisions although Senate Bill No. 507, section 7, of the laws of 1908 provided that they should be repealed and the industrial department of the school discontinued as soon as the schools and workshops to be established for the blind by the commission were in successful operation:

Persons over 21 years of age are received for one year for the purpose of learning a trade taught in the mechanical department. They may also receive instruction in one or more studies if this can be done without interfering with the purpose for which they were admitted. In addition to the one year specified females over 21 years of age are allowed to remain three years more if their capacity renders it advisable.

Chapter 37.

SESSION LAWS OF OKLAHOMA OF 1913.

STATE SCHOOL FOR THE BLIND—LOCATION—APPROPRIATION.

Senate Bill No. 62.

An act to permanently locate the school for the blind at Muskogee, Okla., to be known as the "Oklahoma School for the Blind," providing for the securing of a site; the construction of suitable buildings, and the making an appropriation therefor.

Be it enacted by the people of the State of Oklahoma:

School located at Muskogee.

Section 1. There is hereby created and established a school for the blind at, or near, the city of Muskogee, Oklahoma, to be known as the Oklahoma School for the Blind.

Purpose of School.

Sec. 2. The purpose of such school shall be to provide academic, musical and industrial education suitable for persons deprived of sight.

Control of School.

Sec. 3. The said Oklahoma School for the Blind shall be under the direction and control of the state board of education.

Eligible Pupils.

Sec. 4. All persons, residing in the state of Oklahoma, between the ages of six and twenty-one years, whose vision is so defective as to prevent them attending the public schools, and who are of such physical, mental and moral character as to enable them to pursue any one or all of the courses of study taught in this school, are eligible; provided, persons may be continued in said school after passing the age of twenty-one, or persons under six and over twenty-one may be admitted as pupils in said school at the discretion of the superintendent and faculty.

Site designated—donation of site, light and water.

Sec. 5. The said board of education is hereby authorized to locate said school upon a tract of land described as follows: All that part of the southwest quarter of the southeast quarter of section nineteen, township fifteen north, range nineteen east, which lies east of Haskell Boulevard, containing twenty-five acres, more or less, in Muskogee County, Okla.; said above described tract of land to be deeded to the state of Oklahoma by a good and sufficient deed with abstract, showing the same to be free and clear from all encumbrance, and without expense to the state. Also, electric lights and water to be forever free to the state.

Appropriation.

Sec. 6. There is hereby appropriated out of the general revenue of the state, not otherwise appropriated, the sum of seventy-five thousand dollars (\$75,000) for the erection and construction of suitable buildings, and ten thousand dollars (\$10,000) for a heating plant, and laundry, to be expended and used under the direction of the said board of education.

Approved March 13, 1913.

OKLAHOMA.

1910.

(Abstract taken from the last United States Census.)

School for the Colored Blind.

The school for the colored blind is also under the direction and control of the state board of education. The purpose of the school is to care for, teach and train the colored blind in the rudiments of English, as in graded schools, and the practical and primary industries, such as may fit them for useful citizenship and make them self-helpful and self-reliant.

OREGON STATE BOARD OF CONTROL.

Laws of 1913, Chapter 78.

Section 1. For the purpose of governing the several institutions hereinafter enumerated, there is hereby created a board, the official

name and style of which shall be the "Oregon State Board of Control." Said board shall consist of the Governor, who shall be ex-officio chairman, the secretary of state and the state treasurer; said board shall be known in law by its official name and style; shall have an official seal which shall bear the name of said board; may sue and plead in all courts of law and equity; shall govern, manage and administer the affairs of the Oregon State Insane Asylum, which shall hereafter be known as the Oregon State Hospital; the Eastern Oregon State Hospital, the State Institution for Feeble-Minded, the Oregon State Training School, the Oregon State Penitentiary, the Oregon Institute for the Blind, which shall hereafter be known as the Oregon State School for the Blind, the Oregon School for Deaf Mutes, which shall hereafter be known as the Oregon State School for the Deaf, the State Tuberculosis Sanitarium, which shall hereafter be known as the Oregon State Tuberculosis Hospital, the Oregon Soldiers' Home, which shall hereafter be known as the Oregon State Soldiers' Home, the Capitol building, the Supreme Court building, and such other public institutions, buildings and works as may, from time to time, be created by law and coming within the jurisdiction of said board.

Powers.

Sec. 2. Said board shall do and perform all acts heretofore done and performed by and shall be vested with all authority heretofore vested in the board of trustees of the Oregon State Insane Asylum, the board of trustees of the Oregon State Insane Asylum acting as the governing board of the Eastern Oregon State Hospital; the board of trustees of the State Institution for Feeble-Minded; the board of trustees of the Oregon State Training School; the Governor in his official capacity as the governing authority of the Oregon State Penitentiary and the Oregon Soldiers' Home; the state board of education in its capacity as the governing authority of the Oregon Institute for the Blind, and the board of trustees of the Oregon School for Deaf Mutes; the state commission for the treatment of tuberculosis; the board of public building commissioners, the board of capitol building commissioners and the state purchasing board, all of which said boards, commissions and governing authorities, insofar as they relate to any or all of the above-named institutions and buildings are hereby abolished.

Sec. 3. Said board shall have full authority and exclusive government, direction and supervision over the several institutions enumerated in section 2 of this act; shall make and adopt by-laws for its guidance and for the government of said institutions, provided such by-laws are not inconsistent with the general laws of the state, or the provisions of this act, except as hereinafter provided; shall appoint superintendents and other executive heads of said institutions, and shall select all officers and employes, except in cases where executive heads of an institution are delegated with power and authority to appoint their own subordinates and employes; shall prescribe the duties of said executive heads where the same are not prescribed by law, and such additional duties, beyond those prescribed by law, as it may deem for the good of the public service; shall suspend or dis-

charge executive heads or their subordinates whenever the public service requires such action; shall fix the salaries of all executive heads, subordinates and employes where the same are not fixed by law; shall enter into contracts for the purchase of supplies for said institutions, as well as for fuel, heat, light, water, telephone, equipment, repairs, improvements and betterments, and for the erection, completion and furnishings of all new buildings or additions at said institutions. Said board shall also have full authority to receive, take and hold property, both real and personal, in trust for the state of Oregon, or for any institution which is now or may hereafter be within its jurisdiction, and may sell, transfer, assign, set over or convey the same pursuant to legislative authority; to condemn land and rights-of-way for water pipes, sewers, telegraph, telephone and transmission lines, and to do and perform all legal and peaceful acts requisite and necessary for the successful management and maintenance of said institutions.

Sec. 4. Said board shall hold regular meetings at the state capitol on the third working day of each month, and shall hold such other meetings as, in the judgment of its members, are necessary; a majority of the members of said board shall constitute a quorum. All meetings of said board shall be open to the public and it shall be the duty of said board to cause to be kept a full and correct record of all proceedings, which record shall always be open to public inspection. It shall be the duty of the members of said board to visit each of said institutions, with the exception of the Eastern Oregon State Hospital and the Oregon State Soldiers' Home, at least once every three months and to visit said two institutions last above enumerated at least once every year, and to keep themselves constantly advised as to the condition of all said institutions. It shall be the duty of the executive head of each institution governed by the provisions of this act to submit a biennial report to said board, showing an itemized statement of all receipts and disbursements, the general condition of said institution, a list of all improvements and needed improvements, the number of patients, inmates or wards, the number of officers and employees and the salaries thereof, and such other information as may be of use to said board. Said reports shall be typewritten and shall be submitted in triplicate; they shall represent the condition of each of said institutions on the first day of October preceding the biennial session of the Legislative Assembly, and shall not be printed unless the Legislative Assembly shall, by resolution, so decree. Based upon said typewritten report, said board shall forthwith prepare and cause to be printed a comprehensive report showing the condition of each of said institutions, together with a complete list of receipts and disbursements, an estimate or budget showing the financial needs for the following biennial period, and such other information and recommendations as, in the opinion of said board, will be of value to the members of the Legislative Assembly. In the preparation of said report, technical terms shall be avoided, as far as possible, and every institution shall be treated separately and in plain and intelligible language. It shall be the duty of said board to cause a copy of said report to be mailed to every member of the incoming Legislative Assem-

bly not less than thirty days prior to the convening of said Legislative Assembly.

Sec. 5. Said board shall appoint a secretary, who shall serve during the pleasure of the board and shall receive an annual salary not to exceed two thousand four hundred (\$2,400) dollars, payable quarterly. The secretary shall also receive his actual traveling expenses when traveling in the service of the state, and shall be allowed such clerical assistance as, in the judgment of said board, may be necessary. Before entering upon his duties, the secretary shall take and subscribe to an oath that he will support the Constitution and laws of the United States and the state of Oregon; the secretary shall also give a bond to the state of Oregon in the sum of \$5,000, which bond shall be approved by the board, and shall be conditioned for the honest and faithful discharge of his duties.

Sec. 6. It shall be the duty of the secretary to maintain an office at the state capitol, to keep an accurate record of all the transactions of the board, to preserve records of the several boards heretofore existing for the government of the institutions enumerated in section 2 of this act, to visit all of said institutions at stated intervals, or when directed to do so by the board; to advertise for and receive bids for all supplies, furnishings, repairs, improvements or betterments; to keep the seal of the board and to affix the same to all contracts and instruments executed by the authority and in the name of the board; to prepare all estimates and reports; to examine all samples and to assist the board in all purchases and contracts; to approve all claims; to attend to all correspondence of the board, and to do and perform such other duties as naturally attach themselves to this position, or as may be prescribed by law, or as the said board may direct.

Sec. 7. It shall be the duty of the executive head of each institution governed by this act to report to said board prior to the first day of June and the first day of December of each year, an estimate of the amount, kind and quality of all meat, groceries and other provisions, fuel, clothing, forage, and other material required for the following semi-annual period commencing on the first day of July and the first day of January, respectively, and said board shall then advertise for bids for furnishing the same, said advertisements to be printed twice a week for two consecutive weeks in not more than six newspapers of general circulation; provided, however, that said advertisements shall not specify as to each item of supplies, etc., but shall state in general terms the amount, kind and quality of supplies, etc., desired, and stating that detailed information will be furnished by the secretary; but it shall be the duty of the secretary to cause to be printed and kept in his office, a complete itemized list showing the amount, kind and quality of all supplies, etc., desired, together with instructions to bidders, copies of which shall be distributed among prospective bidders. Bids for supplies shall be opened prior to the first day of July and the first day of January of each year, and no bid shall be considered unless accompanied by a certified check in a sum not less than ten per cent (10 per cent) of the total amount of said bid. All contracts shall be awarded to the lowest bidder or bidders, price and quality considered, but the board shall have the right to reject any or all

bids, and in no case shall it authorize the payment of more than the customary open market place; the said board shall have the right to reject any or all excessive, improper or unreasonable bids, and the provisions of this section shall apply not only to bids for supplies, but also for furnishings, betterments, improvements and new buildings. In the event of an emergency, the board may order the executive head of any institution to purchase supplies or to make repairs without the formality of advertising, provided such supplies are furnished at the lowest market rates, or such repairs are made at the lowest possible cost. Such board may, in its discretion, arrange for the purchase of fuel annually, in December, rather than semi-annually.

Sec. 8. No member or officer of said board, or officer, employee or other person connected with any of the institutions governed by this act, shall be, in any wise, pecuniarily interested in any contract for supplies or services, other than the services of his or her regular employment. The secretary of state is hereby authorized and directed to audit and pay all claims for supplies or materials furnished or services rendered in pursuance of the provisions of this act upon the presentation of duly verified vouchers therefor, approved in writing by the executive head of the institution affected, and the secretary and at least two members of the board.

Sec. 9. At the end of each month, the executive head of each institution shall cause a payroll to be made, which payroll shall show the name of each person employed, the capacity in which such person is employed, the rate of salary or wages, and the amount due, and upon receipt of said payroll, duly certified to by said executive officer, it shall be the duty of the secretary to examine the same, and the board, if said payroll is found correct and regular in every way, shall approve the same and present it to the secretary of state, whose duty it shall be to audit said payroll and draw a warrant upon the state treasurer, in favor of said executive head, in payment of the same, in a like manner as other warrants are drawn for the payment of claims against the state.

Sec. 10. In order to minimize the cost of maintaining the several institutions, all wards of the state who are capable of a reasonable amount of work without physical or mental injury to themselves shall be used as fully as possible in the production and manufacture of articles for the use of, and in the performance of labor for the state, but it shall be unlawful for the board to enter into any agreement or contract with any private person, firm or corporation for the employment of convicts of the Oregon State Penitentiary or to place any prison-made goods on sale in the open market in competition with the products of free labor. In order to encourage industry and thereby increase productiveness of the several institutions, the board may prescribe rules and regulations for the sale and exchange of surplus products of each; provided, that the funds derived from the sale of same shall be paid into the state treasury and become a part of a fund to be known as the State Institutional Betterment Fund, which fund may be expended by said board for the benefit of the several institutions in proportion to the amount earned by each. All lands now, or which may hereafter be owned by the state and devoted to the

uses of any of the institutions located at or near the state capitol shall be treated by the board as if held in common for the use and benefit of all of said institutions and in the apportionment and assignment of said lands for the future use of said institutions, the needs of each, the proximity of the lands and ability to cultivate shall be given due consideration.

Sec. 12. The board shall require the several institutions to adopt and maintain, as far as practicable, a uniform system of accounts so as to permit a ready comparison as to the cost of operation of each institution and shall require each executive officer of said institutions to file monthly reports showing fully the financial and other transactions of the institution and its existing population, conditions, etc., also containing such recommendations or suggestions as, in the opinion of the executive officer, will tend to promote the best interests of the institution.

Sec. 13. Any and all funds received by the state from the federal government, or other sources, for the aid and support of any of the said institutions, shall be paid into the state treasury and disbursed by the board in the usual manner for the uses intended.

Sec. 14. The executive heads of the Oregon State Hospital, the Eastern Oregon State Hospital, the State Institution for Feeble-Minded, the Oregon State Training School, the Oregon State School for the Blind, the Oregon State School for the Deaf, and the Oregon Tuberculosis Hospital shall be known as the superintendents of said institutions; the executive head of the Oregon State Penitentiary as the warden of said institution; the executive head of the Oregon State Soldiers' Home as the commandant of said institution, and the executive head of the capitol and supreme court buildings as the custodian of said buildings. All of said executive heads, except the custodian of the capitol and supreme court buildings, shall be selected and may be removed at the pleasure of the board, and before assuming the duties of their position, said executive heads shall take and subscribe to an oath that they will support the Constitution and laws of the United States and the state of Oregon, and each shall furnish to the state of Oregon, subject to the approval of the board, a bond, in such reasonable amount as the board may designate, conditioned upon the faithful performance of their duties. Said executive heads shall, subject to the approval of the board, appoint all assistants, officers, and other employees at the institutions under their jurisdiction, and may suspend or remove them, reporting all acts of suspension or removal to the board for approval or disapproval; provided, however, that the custodian of the capitol and supreme court buildings shall have absolute authority in the matter of appointing, suspending or discharging the employees used in the maintenance and operation of said buildings and the grounds adjacent thereto, except as hereinafter provided. Said executive heads shall have control of the wards of the state at the institutions under their jurisdiction; shall prescribe or direct their treatment, care, custody and discipline, unless otherwise directed by law or by the rules of the board; adopt sanitary measures for their health and comfort; promote their mental, moral and physical welfare and development, and shall enjoy such other powers and privileges

and perform such other duties as may be prescribed by law or rule of the board or as naturally attach themselves to their respective positions. Said executive heads, with the exception of the custodian of the capitol and supreme court buildings, shall reside at the institutions under their respective jurisdictions and shall be furnished, free of charge, with a residence or housekeeping rooms for himself and his immediate family, household furniture, provisions, heat and light from the supplies of the said institutions. The annual salaries of the several executive heads shall be as follows:

Supt. Oregon State School for the Blind.....	\$1,200.00
Supt. Oregon State School for the Deaf.....	1,500.00

Said executive heads shall receive no other fees or emoluments, but shall receive their actual traveling expenses when traveling in the service of the state.

Oregon State School for the Blind.

Sec. 27. The Oregon State School for the Blind, situated in the city of Salem, county of Marion, shall be used as a free training school for such blind persons as are now or may hereafter be enrolled; provided, however, the length of time which any pupil may continue in school shall not exceed ten (10) years, except in special cases the board may extend the time from year to year. No pupil shall be detained in school after it has been ascertained that such pupil has ceased to make progress or is not being benefitted. Any pupil may be dropped for cause, at any time, by the board. It shall be the duty of the superintendent of said school to see that each person enrolled is given reasonable instruction in the subject taught at said school, and to select the necessary teachers and employees for the successful maintenance of said school according to the methods in vogue in similar institutions.

Further Powers and Duties of Board.

Sec. 32. Said board shall authorize the employment of all necessary physicians, matrons, attendants, nurses, engineers, watchmen, messengers, clerks, guards, cooks, waiters and other officers and employees not specifically authorized by this act and necessary to the successful maintenance of the several institutions, but the amounts which shall be expended for the services of such officers and employees shall never be in excess of the amounts which shall be provided therefor in the biennial appropriations for said institutions. Said board shall designate in its by-laws which of the said employees shall be officers, and shall require all such officers to take and subscribe to an oath of office, and, if the circumstances require it, to furnish bonds. All regular officers and employees, except those of the capitol and supreme court buildings, shall be furnished with board, lodging, heat and light at the expense of the institution to which they are attached, unless the executive head of such institution shall permit officers and employees to maintain their own establishments or reside elsewhere. Said board shall not consider any petition or proposition for salary or wage increases unless the same shall be endorsed in writing by the executive head of the institution from which said petition or proposition arises. Said board shall have the right to do and perform all requisite and

necessary acts, in addition to those authorized herein for the successful maintenance of the several institutions under its jurisdiction; provided such acts are not in conflict with the Constitution and laws of the United States or the state of Oregon.

Sec. 33. No member of said board shall receive any salary, fee or other compensation for services rendered as a member of said board, but shall receive all necessary traveling expenses from the funds appropriated by this act when traveling on tours of inspection of the several institutions.

Sec. 34. For the purpose of paying the salaries of the secretary and other officers and employees of the board and of defraying the expenses of clerical aid, stationery, postage stamps, printing, advertisements, traveling expenses of the board and the secretary, and such other incidental expenses as may properly be charged to the maintenance of the board and the carrying on of its work, there is hereby appropriated for the year 1913, and annually thereafter, the sum of seven thousand and five hundred (\$7,500.00) dollars, or so much thereof as may be necessary; provided, however, that any unexpended balance at the end of each year shall revert to and become a part of the general fund of the state. The moneys so appropriated shall be paid out only upon warrant drawn by the secretary of state on the state treasurer. In estimating the need of the several institutions, the executive heads of the same shall take into account the funds appropriated by this act and shall not include in their own estimates the clerical and other expenses heretofore defrayed out of the funds of each separate institution, but hereafter payable out of the funds appropriated by this act.

Sec. 35. Whenever the word "Board" appears in this act it shall, unless otherwise designated, be construed to mean the Oregon State Board of Control; wherever the word "institution" appears, it shall, unless otherwise designated, be construed to mean an institution governed by the provisions of this act, and whenever the word "secretary" appears, it shall, unless otherwise designated, be construed to mean the secretary of the Oregon State Board of Control.

OREGON.

1913.

Compulsory Education.

The truant officers of the state must at the beginning of each school month report to the county judge of their respective counties the names, ages and residence of all blind children between the ages of 8 and 18 years, with the names of their parents or the persons in charge of them. He must also make a statement as to whether the parents or guardians are able to educate such child or whether the interests of such child would be promoted by sending it to the state school. The child may be brought before the judge for a hearing and if the judge is satisfied that the child is not being properly educated at home and will be benefited by attending the state school and is a suitable person to receive instruction there, he may send the child to the school. All expenses are paid by the child's county of residence if the parent is unable to pay. These provisions apply only to children who are en-

titled to instruction at the school under the rules and regulations of the board of control. The clerks of the several school districts must report the names, addresses and ages of all blind children between the ages of 6 and 14 years within their respective districts, together with the names of the parents of such children, which come or are brought to their attention, to the county school superintendent of the county, who must report them to the superintendent of the school for the blind.

PENNSYLVANIA.

1887.

Section 1 of the Acts of General Assembly approved May 25, 1887, provide as follows:

"That the time for which indigent pupils of this commonwealth may be taught in institutions for the instruction of the blind, at the expense of the commonwealth, is hereby extended to twelve years from the time of entering said institutions."

LEGISLATURE OF PENNSYLVANIA.

An Act to amend an act approved the eighteenth day of May, one thousand nine hundred and eleven, entitled "An act to establish a public school system in the Commonwealth of Pennsylvania together with the provisions by which it shall be administered and prescribing penalties for the violation thereof, providing revenue to establish and maintain the same, and the method of collecting such revenue and repealing all laws general, special or local, or any parts thereof that are or may be inconsistent therewith, by providing for the (care and) education of certain blind children under eight years of age."

Section 1. Be it enacted by the Senate and the House of Representatives of the Commonwealth of Pennsylvania in General Assembly met, and it is hereby enacted by the authority of the same, that the act approved the eighteenth day of May, one thousand nine hundred and eleven entitled "An act to establish a public school system in the commonwealth of Pennsylvania, together with the provisions by which it shall be administered and prescribing penalties for the violation therefore, providing revenue to establish and maintain the same, and the method of collecting such revenue, and repealing all laws general, special and local, or any parts thereof that are or may be inconsistent therewith," is amended by adding article XVI, a new section, which reads as follows:

Section 1439. The State Board of Education is authorized to (care for and) educate blind children residing in this commonwealth under the age of eight years, whenever from any cause the parent or parents thereof may be unable properly to (care for and) educate them, with the written consent of the proper parent, parents or nearest relative if there be no parents, or the poor authorities of the proper poor district, if there be neither parents or relatives, the board may contract with any non-sectarian institution in this state or elsewhere, established for the care, education and maintenance of the blind, whereby any such children may at a cost not exceeding one dollar (\$1.00) per day, to be paid out of the state school fund, be (cared for and) educated until it shall reach the age of eight years. The contract may be cancelled and the child or children removed at any time by the board.

This act shall not repeal or modify any existing act relative to the education of the blind.

PENNSYLVANIA.

1887.

CHARTER OF INCORPORATION

Granted by the

COURTS OF ALLEGHENY COUNTY, January 8th, 1887.

Commonwealth of Pennsylvania—ss.

Be it remembered that H. Kirks Porter, A. M. Marshall, Wm. A. Herron, John A. Wood, Henry Holdship, Rev. E. R. Donehoo, B. F. Long, John H. Ricketson, John W. Chalfant, Dr. J. A. Lippincott, A. M. Brown, William Thow, George W. Dilworth, C. F. Dean, Oliver P. Scaife, Rev. E. P. Cowan, Rev. J. T. McCrory, L. H. Harris, Thomas Ewing, Morris H. Danziger, John R. McCune, Samuel S. Brown, Dr. W. H. Winslow, Chas. J. Clarke and Rev. John G. Brown, all citizens and residents of the County of Allegheny, and Commonwealth of Pennsylvania, have formed a voluntary association for the support of a charitable undertaking, to-wit: The education and maintenance of the blind, and desire to be incorporated for the purpose aforesaid, by the name of "Western Pennsylvania Institute for the Blind," under and pursuant to the provisions of the Act of Assembly of said commonwealth entitled "An act to provide for the incorporation and regulation of certain incorporations, approved April 29th, 1874, and to have all the powers conferred upon such corporations by said act of assembly; and, for the purpose aforesaid, they have made the following Certificate of Incorporation, and pray that the same may be duly approved and recorded as their

CHARTER.

1. The name of the corporation shall be the "Western Pennsylvania Institution for the Blind."

2. The said corporation is formed for a charitable purpose, to-wit: The education and maintenance of the blind.

3. Said corporation shall be located within the county of Allegheny, and its chief office and place of business shall be in the city of Pittsburgh.

4. Its charter shall be perpetual.

5. The number of directors shall be nine, and the names and residences of those chosen directors for the first year are as follows, viz: A. M. Marshall, Allegheny City; Capt. John A. Wood, Chartiers Township; Rev. E. R. Donehoo, Pittsburgh; Wm. A. Herron, Pittsburgh; C. F. Dean, Pittsburgh; John H. Ricketson, Allegheny City; G. W. Dilworth, Pittsburgh; J. M. Schoonmaker, Pittsburgh; H. K. Porter, Pittsburgh, all of the county of Allegheny.

6. The said corporation shall have neither shares nor capital stock, but it shall take and hold both real and personal property, by purchase, gift, grant, devise and bequest, as the purpose of the corporation may require, not exceeding the amount limited by law.

In testimony whereof the said corporators have subscribed this Certificate and Charter the 13th day of December, A. D. 1888.

County of Allegheny—ss.

On the 31st day of December, A. D. 1886, before me, the Recorder of Deeds of said county, personally came A. M. Brown, E. R. Donehoo and William A. Herron, who have subscribed the foregoing Certificate of Incorporation and duly acknowledged the same to be their act and deed, and I do hereby certify the same under my hand and seal, conformably to law, the day and year aforesaid.

WILLIAM H. GRAHAM,
Recorder of Deeds.

(SEAL)

Commonwealth of Pennsylvania }
County of Allegheny } ss.

The foregoing certificate of incorporation of the "Western Pennsylvania Institution for the Blind," having been presented to me, Christopher Magee, one of the law judges of the Court of Common Pleas, No. 2, of the County of Allegheny, on this 8th day of January, A. D. 1887, and it appearing that the same is duly certified under the hand and official seal of the recorder of deeds of said county, and accompanied by due proof of the publication notice of said application for a charter of incorporation; and having perused and examined said instrument, and found the same to be in proper form, and within the purposes named in the first class specified in the second section of the Act of Assembly entitled "An act to provide for the incorporation and regulation of certain corporations," approved the 19th day of April, 1874, and the same appearing to be lawful, and not injurious to the community, I do find and endorse thereon these facts, and do order and decree thereon that the said charter is approved, and that upon the recording of said charter and this order, the subscribers thereto and their associates shall be a corporation for the purposes and upon the terms therein stated, and the said order and charter shall be recorded in the office for the recording of deeds in and for the county aforesaid, and from henceforth the persons named therein and subscribing the same, and their associates and successors, shall be a corporation by the name therein given.

CHRISTOPHER MAGEE,
Law Judge, Common Pleas No. 2.

January 8, 1887.

State of Pennsylvania }
Allegheny County } ss.

I, William H. Graham, Recorder of Deeds in and for the county aforesaid, do hereby certify that the foregoing charter of incorporation of the Western Pennsylvania Institution for the Blind, with the order and decree of the Honorable Christopher Magee, one of the Judges of the Court of Common Pleas No. 2, of the County of Allegheny, endorsed thereon, was duly recorded in the office of the Recorder of Deeds in and for said county, in charter book No. 10, page 472, on the 10th day of January, A. D. 1887.

In testimony whereof, I have hereunto subscribed my name and affixed my official seal, the day and year aforesaid.

WILLIAM H. GRAHAM,
Recorder.

IN THE COURT OF COMMON PLEAS OF ALLEGHENY COUNTY,
PENNSYLVANIA.

In re Incorporation of the

PENNSYLVANIA ASSOCIATION FOR THE BLIND.

No. 869. July Term, 1912.

Certificate of Incorporation.

To the Honorable the Judges of said Court:

The undersigned subscribers, citizens of the commonwealth of Pennsylvania, having associated themselves for the purposes hereinafter mentioned and being desirous of becoming incorporated agreeably to the provisions of the Act of Assembly of the commonwealth of Pennsylvania entitled "An act to provide for the incorporation and regulation of certain corporations," approved the 29th day of April, 1874, and its various supplements, do hereby declare, set forth and certify that the following are the purposes, objects, articles and conditions of this association for and upon which they desire to be incorporated:

First. The name of the corporation shall be Pennsylvania Association for the Blind.

Second. The purpose for which the corporation is formed is the support and promotion of the interests of the blind and the prevention of unnecessary blindness, and more particularly:

- (1) To act as a bureau of information and industrial aid.
- (2) To establish, equip and maintain one or more schools for industrial or agricultural training and workshops for the employment of the blind.
- (3) To devise a means for the sale and distribution of the products of such schools and plants and homeworkers.
- (4) To provide industrial instruction for blind women in their own homes.
- (5) To aid the poor, aged and infirm blind who are not capable of learning a trade.
- (6) To aid in the prevention of blindness.
- (7) To arouse the public to a clearer appreciation of the capabilities of the blind

Third. The place where the business of the corporation is to be transacted is in the city of Pittsburgh, county of Allegheny and state of Pennsylvania.

Fourth. The corporation is to exist perpetually.

Fifth. The names and residences of the subscribers are as follows: Col. J. M. Schoonmaker, Mrs. Phoebe Ruslander, Dr. William W. Blair, Dr. Paul Franklin, Mr. Geo. D. Edwards, Miss Jesse Welles, Mrs. Pauline B. Friend, Mrs. Mary Morrison Barr, Dr. Amelia Dranga, Mr. Wm. H. Long, Mr. Thos. McQuaide, Mr. Wm. Grant Chambers, Mr. Harry M. Shafer, Mrs. Rose F. Sunstein, Mr. Charles C. Cooper, Dr. F. H. Frederick, Mrs. Mary M. Flannery, Mr. Thomas S. McAloney, Mrs. Nina H. McCullough, all of Pittsburgh, Pa.

Sixth. The officers of the corporation or association shall be a president, three vice presidents, a recording secretary, a corresponding secretary, a treasurer and a board of directors of eighteen. The officers and the board of directors chosen for the first year, except as other-

wise shown, are the following: President, Col. J. M. Schoonmaker, Pittsburgh, Pa. Vice presidents, Mrs. Phoebe Ruslander, Dr. William W. Blair and Dr. Paul Franklin, all of Pittsburgh. Recording secretary, Miss Jesse Welles, Pittsburgh. Corresponding secretary, Mrs. Pauline B. Friend, Pittsburgh. Treasurer, Mr. George D. Edwards, Pittsburgh. Board of directors, terms expiring 1913, Mrs. Mary Morrison Barr, Dr. Amelia Dragna, Mr. William H. Long, Mr. Thomas McQuaide, Dr. William W. Blair, Mr. William Grant Chambers, all of Pittsburgh, Pa.

Terms expiring 1914: Mr. Harry M. Shafer, Mrs. Rose F. Sunstein, Mr. Chas. C. Cooper, Mr. Geo. D. Edwards, Mrs. Pauline B. Friend, Dr. F. H. Frederick, all of Pittsburgh, Pa.

Terms expiring 1915: Mrs. Mary M. Flannery, Mr. Thos. S. McAloney, Mrs. Nina H. McCullough, Col. J. M. Schoonmaker, Mrs. Phoebe Ruslander, Miss Jesse Welles, all of Pittsburgh.

Seventh. The corporation not being for profit, there is no capital stock. The association will be maintained out of membership dues, donations and contributions.

Eighth. The corporation shall have power to purchase and hold such real and personal property as its purposes may require and the same or any part thereof to grant, bargain and sell, mortgage, improve or dispose of, and in general to do all things which may be lawful and necessary for the well-being and proper management of the said corporation; provided that the real estate of the said corporation shall not exceed the amount limited by law.

Ninth. The corporation shall have the right to adopt a constitution and by-laws for its government, and to change, alter or amend the same, not inconsistent with the constitution or laws of this commonwealth.

Signed—J. M. Schoonmaker, Mrs. Phoebe Ruslander, William W. Blair, Dr. Paul H. Franklin, Geo. D. Edwards, Jessie Welles, Mrs. Pauline B. Friend, Mrs. Mary Morrison Barr, Dr. Amelia Dragna, W. H. Long, Thos. A. McQuaide, William Grant Chambers, Harry M. Schafer, Mrs. Rose Sunstein, Charles C. Cooper, Dr. F. H. Frederick, Mrs. Mary M. Flannery, Thos. S. McAloney, Nina H. McCullough.

Order issued 27th day of May, A. D. 1912.

(Signed) ROBERT S. FRAZIER,

Resident Judge Court of Common Pleas of Allegheny County.

From the Record:

WILLIAM B. KIRKER,

Prothonotary.

PENNSYLVANIA.

1913.

Section 1413. It shall be the duty of the county or district superintendent, attendance officer or secretary of the board of school directors, in every school district in this commonwealth, to report to the medical inspector of the school district every blind, deaf, or mentally deficient child in the district, between the ages of eight (8) and sixteen (16) years, who is not being properly educated and trained. The medical inspector of the school district shall examine such child, and report to the board of school directors whether it is a fit subject for educa-

tion and training. If the child is reported to be a fit subject for education and training, but cannot be properly educated and trained in the public schools of the district, the board of school directors shall secure for it proper education and training; Provided, that when it is necessary to educate or train such children outside of the public schools, their parents or guardians shall, if able to do so, pay to the district the expense necessarily incurred by it in educating and training the same; And provided further, that any child who is reported by the medical inspector of the school not to be a fit subject for education and training shall be exempt from the provisions of this act.

Senate Bill No. 50 of the Laws of 1913.

An act to amend the act approved the eighteenth day of May, one thousand nine hundred and eleven, entitled "An act to establish a public school system in the commonwealth of Pennsylvania," by providing for the education of certain blind children, under eight years of age.

Approved—The 8th day of May, A. D. 1913.

PENNSYLVANIA.

(Abstract taken from the last United States Census.)

Education of the Blind.

1915.

Appropriations are made by the state for the education of indigent blind residents of the state in two private institutions for the blind. Indigent blind pupils may be taught in institutions at the expense of the state for twelve years from the time of entering the institution. Appropriations were also made in 1915 for the Pennsylvania Association for the Blind, the Pennsylvania Home Teaching Society and Free Circulating Library for Blind Men, and the Pennsylvania Working Home for Blind Men.

Census of the Blind.

1903.

At the time of taking the septennial census the assessors of other officers must make out a separate list of the blind persons, if any, resident in their respective townships, towns, wards or districts, distinguishing their sex, color, and as nearly as may be, their several ages; and it is the duty of the commissioners of the several counties to make returns of the census to the Governor.

Exemption of the Blind.

1903.

The blind are specially exempted from the penalties of the law against tramps.

RHODE ISLAND.

1909.

Section 1. The Governor, on recommendation of the state board of education, upon application of the parent or guardian, may appoint any deaf, blind or imbecile child, being a legal resident of this state, who shall appear to said board to be a fit subject for education, as a state beneficiary at any suitable institution or school now established or that may be established, either within or without the state, for such period as he may determine, within the limit of ten years: Provided,

that he may, upon the special recommendation of the state board of education, extend the period and that he shall have the power to revoke any appointment at any time for cause.

Sec. 2. The board of education are hereby clothed with the duty and responsibility of supervising the education of all such beneficiaries and no child appointed as above shall be withdrawn from any institution or school except with their consent, or the consent of the Governor; and said board shall annually report to the general assembly their doings under this chapter, with such further information in relation to the several institutions at which these beneficiaries have been placed as may be deemed desirable.

Sec. 3. The board of education may expend in the purchase of necessary clothing for such beneficiaries a sum not exceeding twenty dollars, in any calendar year, for a single child.

Sec. 4. All bills arising under this chapter shall be examined and approved by the board of education, and the state auditor is hereby authorized to draw his orders on the general treasurer for the payment thereof when properly certified by the secretary of the board and approved by the Governor; and a sum not to exceed seventeen thousand dollars, or so much thereof as may be needed, is hereby annually appropriated therefor out of any money in the treasury not otherwise appropriated.

RHODE ISLAND.

1913.

It is enacted by the General Assembly as follows:

Sec. 1. Chapter 100 of the General Laws entitled "Of provision for the education of the deaf, blind and imbecile children," is hereby amended by adding thereto the following sections:

Sec. 4. The state board of education shall have power to provide for the suitable care, maintenance and instruction of babies and children under school age residing in this state, who may be born blind or become blind, in any case where by reason of lack of means or other cause the parent or parents of such children may be unable to properly care for and educate such children.

Sec. 5. For the purpose of providing such care, maintenance and education the said board of education shall have power to contract with any institution having or furnishing facilities for such care, maintenance and education in this or any other state at a contract price to be agreed upon, not exceeding one dollar per day. Provided, that such contract shall be made by and with the written consent of the parents or the surviving parent of any such child.

Sec. 2. Section 4 of said chapter 100 of the general laws is hereby renumbered section 6.

Sec. 3. This act shall take effect upon its passage, and all acts and parts of acts inconsistent herewith are hereby repealed.

RHODE ISLAND.

January Session, 1911.

An Act in amendment of Section 16 of Chapter 63 of the General Laws, entitled "Of the Board of Education."

It is enacted by the General Assembly as follows:

Section 1. Section 16 of Chapter 63 of the General Laws, entitled "Of the Board of Education," is hereby amended so as to read as follows:

"Section 16. The state board of education is hereby authorized and empowered to provide for the instruction at their homes of adult blind residents of this state upon such conditions and in such manner as may seem proper to said board; and the sum of three thousand dollars is hereby annually appropriated for the purpose of carrying the provisions of this section into effect."

Sec. 2. For the purpose of carrying this act into effect the sum of five hundred dollars is hereby appropriated, out of any money in the treasury not otherwise appropriated; and the state auditor is hereby directed to draw his orders upon the general treasurer for the payment of said sum or so much thereof as may be necessary upon the receipt of vouchers properly authenticated by said board.

Sec. 3. This act shall take effect on and after its passage and all acts and parts of acts inconsistent herewith are hereby repealed.

RHODE ISLAND.

1917.

The appropriation bill of 1917 reads as follows:

"For the instruction of adult blind residents of the state at their homes, three thousand dollars.

"For the education of blind and imbecile children, ten thousand dollars."

The figure ten thousand is explained as being the amount considered sufficient for these purposes by the budget committee after estimate, although an outside limit of seventeen thousand dollars is allowed by law.

RHODE ISLAND

1913.

Section 1. Chapter 100 of the General Laws, entitled "Of Provision for the Education of Deaf, Blind and Imbecile Children," is hereby amended by adding thereto the following sections:

4. The state board of education shall have power to provide for the suitable care, maintenance and instruction of babies and children under school age residing in this state who may be born blind or become blind in any case where by reason of lack of means or other cause the parent or parents of such children may be unable to properly care for, maintain and educate such children.

5. For the purpose of providing such care, maintenance and education the said board of education shall have power to contract with any institution having or furnishing facilities for such care, maintenance and education in this or any other state at a contract price to be agreed upon, not exceeding one dollar (\$1) per day: Provided, that such contract shall be made by and with the written consent of the parents or the surviving parent of any such child.

Signed by Governor A. J. Pothier.

April 23, 1913.

RHODE ISLAND.

(Abstract from the last United States Census.)

Education of the Blind.

1911.

The State Board of Education may provide for the instruction at their homes of adult blind residents of the state, and \$3,000 is annually appropriated for this purpose.

Exemption of the Blind.

1909.

The blind are specially exempted from the penalties of the laws applying to tramps.

SOUTH CAROLINA.

Chapter XXVII.

Code of Laws, S. C.

1912.

1918. *Board of Commissioners.* The Board of Commissioners for the South Carolina Institution for the Education of the Deaf and Dumb and the Blind shall consist of five members as follows: The Superintendent of Education, ex-officio, and four members to be appointed by the Governor, three of whom shall reside in Spartanburg County. The term of office of aforesaid four members shall be, respectively, two, four, six and eight years, the terms of each to be designated by the Governor when appointed. At expiration of term of office of any member of the board, the Governor shall fill vacancy by appointment for term of eight years, the Governor to have power to remove for cause at any time. The said board shall be allowed actual expenses for not more than two meetings in each year, to be paid by the superintendent of the institution. Nothing herein contained shall interfere with the present board of trustees and until after their term of office expires.

1919. *Duties and Powers of Board.* The Board of Commissioners are vested with the supervision and control of affairs and government of said institution, with power to regulate salaries of officers and teachers, to establish conditions, forms and regulations for the admission of pupils therein, and to prescribe rules and by-laws as in their judgment shall be necessary for the management and good government thereof.

1920. *Superintendent—How Elected.* The superintendent of said institution shall be elected by said Board of Commissioners and shall be the immediate executive head of the institution, and shall be responsible to the Board of Commissioners.

1921. *Duties and Powers of Superintendent.* The superintendent shall nominate all his subordinate officers and teachers, subject to the approval of the Board of Commissioners; he shall be the official medium of communication between the board and said subordinate officers and employees; shall make all regulations of internal police; shall authorize the purchase of ordinary supplies, and shall examine and certify to the correctness of all bills of such supplies.

1922. *Meetings of Board.* The Board of Commissioners shall elect a chairman and secretary from their number, and shall meet annually on the first Wednesday in August at the institution, and at such other

times and places as the chairman of the board shall direct. The Board of Commissioners shall receive no compensation for their services.

1923. *Reports of Board.* The Board of Commissioners shall draw the annual appropriation as made by the Legislature for the support and maintenance of said institution, and shall annually report to the Legislature a statement of their various acts and doings during the past year, showing exactly how they disbursed the money received and expended and file vouchers covering the same in the office of the Comptroller General.

1924. *All Deaf Mutes and Blind Persons Admitted.* All deaf mutes and blind of the state who are of proper age and mental capacity (each case to be decided by the Board of Commissioners) shall be admitted to the benefits of the institution.

1925. *Expenses of Applicants.* The whole or part of the expenses of the several applicants shall be paid according to the opinion which the commissioners may form as to the pecuniary condition of the applicants; and in case of more applications than would exhaust the annual appropriation, the commissioners shall make selections according to their opinion of the deserts of the various applicants.

1926. *Expenses of Pupils.* The sum which shall be allowed for the board, tuition and all incidental expenses of one deaf mute or blind person for one year shall not exceed one hundred and fifty dollars, not including therein traveling expenses, clothing and medical attention which the commissioners shall place upon the most economical scale.

1927. *Board May Provide for Higher Education of Any Graduate.* The Board of Commissioners of the School for the Deaf, Dumb and Blind may, upon the recommendation of the superintendent and faculty appropriate one hundred and fifty dollars (\$150.00) annually to provide for the higher education of any graduate thereof matriculating in any special or regular course offered in any chartered college.

The board shall make suitable regulations for each student, but not more than four graduates shall be thus aided in any one year.

POLITICAL CODE OF SOUTH DAKOTA.

Chapter 9, Article 4.

The South Dakota Blind Asylum.

569. An institute for the care and education of the blind, to be known as the "South Dakota Blind Asylum," heretofore located and established on a plat of land in the town of Gary, in the county of Deuel, and known as the "Court House Block," shall continue as such and shall be under the control and supervision of the State Board of Charities and Corrections.

570. It shall be the duty of the said board to make all necessary rules for the government of the same, and to employ a superintendent and such instructors and attendants as may be necessary.

571. Each county superintendent of schools shall report to the county commissioners of his county, at any regular meeting of said commissioners the name, age, name of parent or guardian, and post office address of every blind person and all such persons as may be too blind to acquire an education in the common schools, between the age of ten and thirty years, residing in his county.

572. It shall be the duty of the county commissioners, when they have been notified that there are any blind persons in their county who are entitled to the benefits of an institution for the support and education of the blind, to at once report the name, age and residence of such persons in their county to the Governor of this state.

573. Every blind person of this state and all such as may be too blind to acquire an education in the common schools, of suitable capacity, between the ages of ten and thirty years, shall be entitled to receive an education of at least eight years at the expense of the State of South Dakota, at said institution for the support and education of the blind: Provided, that the time that any pupil or pupils have spent in any institution for the education of the blind shall be deducted from the eight years above mentioned.

574. In order to entitle any blind person to the benefits of this article it shall be necessary for such person to obtain a certificate of the superintendent of schools of the county in which said person resides, that such person, giving name, age and place of residence, is blind, or too blind to acquire an education in the common schools, and is entitled to the benefits of such an institution, which certificate shall be approved by the Governor; and upon presentation of such certificate and an order from the Governor to the authorities of the institution to admit such person, specifying the time for which he or she shall be admitted, such person shall be admitted into such institution and receive all the benefits of the same.

Fifteenth Session, Legislative Assembly, State of South Dakota.

HOUSE BILL NO. 279.

Introduced by Mr. McFarland.

A Bill for an Act entitled, An Act to Provide for the Care, Maintenance and Instruction of the Blind Babies and Children Under School Age.

Be it enacted by the Legislature of the State of South Dakota:

Section 1. The Board of Charities and Corrections shall have power to provide in the State of South Dakota for the South Dakota School for the Blind or any other institution that can give proper care and education for the suitable care, maintenance and instruction of blind babies and children under school age, residing in this state, who may be born blind or become blind.

Sec. 2. For the purpose of providing for this care, maintenance and education the said Board of Charities and Corrections shall have the power to furnish all necessary attendance and facilities for the suitable care, maintenance and education of such blind babies and children under school age in South Dakota, either in the South Dakota School for the Blind or any other properly equipped institution, and to provide for the transportation of such blind babies and children under school age from their place of residence to such institution.

Sec. 4. Whereas an emergency exists, in that there is no law in this state for the admission of the blind babies or children under school age into the South Dakota School for the Blind or any other institution therefor, this act is declared to be necessary for the immediate preservation of the public health and safety and shall be in force and effect from and after its passage and approval.

SOUTH DAKOTA.

(Abstract from the last United States Census.)

Compulsory Education.

1907-1911-1913.

The county superintendent of schools of any county must notify and require every parent or guardian or person having control of blind persons between the ages of 6 and 30 years who have been unable to receive an education at the public schools and who have not received instruction at any institution for the blind to send such persons to the state school for the blind. In case a person having control of such blind persons, after 10 days' notice, refuses or neglects to do as required, the county school superintendent must make complaint, stating all these facts, to the county judge. The county judge must investigate the matter, and if the facts set forth in the complaint are found to be true, must order the parent or person having charge of the blind person to send him to some school for the education of the blind.

It is the duty of every county or city superintendent of schools to send to the superintendent of the school for the blind the names of all blind children of proper school age residing in his county or city whenever the residence of the blind children within their jurisdiction becomes known to them, and the superintendent of the school for the blind must take all necessary action to provide that the blind children be given the advantages of proper education.

Chapter 187.

(S. B. 101)

PROVIDING FOR ADMISSION OF PUPILS TO THE SCHOOL FOR THE BLIND.

An Act entitled, An act to provide for admission of pupils to the School for the Blind at Gary, South Dakota, and repealing sections 571, 572, 573 and 574 of the Political Code of Revised Code of 1903, of South Dakota.

Be it enacted by the Legislature of the State of South Dakota:

1. Whenever it shall come to the notice or knowledge of the county superintendent of schools of any county in this state, that any person residing in such county, between the ages of six and thirty years, by reason of blindness, either partial or total, has not received and is unable to receive the full benefits of the public schools, and is not regularly attending a school for the blind, and has not received a full course of instruction in any institution for the blind and is in need of such instruction, it shall be the duty of such county superintendent of schools to forthwith notify and require the parent, guardian or custodian of such person to send such person, forthwith, to the South Dakota School for the Blind; and in case such parent, guardian or custodian shall, for the space of ten days after such notice, refuse or neglect to send such person to said school for the blind, such county superintendent of schools shall make complaint before the county judge of such county, setting forth the age and place of residence of such person and that such blind or partially blind person is being deprived of an education by the refusal or neglect of his or her parent, guardian or custodian, and thereupon such county judge shall investi-

gate such matter and make such order and take such proceedings as are or may hereafter be provided by law.

2. All persons, residents of this state, between the ages of six and thirty years, who, by reason of blindness, either partial or total, have not received and are unable to receive the full benefits of the public schools, and who shall be capable of receiving instruction, and who are free from contagious or chronic diseases, and physically fit to attend such school shall, upon application to the superintendent of the South Dakota School for the Blind, be received and taught, free of charge, at such school and shall be entitled to receive an education of at least ten years at the expense of the state of South Dakota at the said institution for the support and education of the blind, if within the age limit prescribed in this section; and the time that any pupil or pupils shall have spent in any institution for the education of the blind shall be deducted from the ten years above specified; provided, however, that all pupils shall, in any event, be entitled to such support and education until they shall have arrived at the age of eighteen years. And pupils under the age of six years or over the age of thirty years may, when circumstances warrant or require it, with the approval of a majority of the state board having control of said school, be received and taught therein as herein provided. Like pupils may be received from without the state upon payment to the superintendent of such school, of such charges for board, tuition and care, as shall be fixed by the state board having charge of such institution; but no pupil from without the state shall be received to the exclusion of any pupil resident of this state from any of the privileges or benefits of the school. If, in the judgment of the state board having control of said institution, upon recommendation of the superintendent of the said school a pupil is capable, and by reason of general fitness is qualified to receive advanced instruction for the purpose of fitting such pupil to enter a college or higher institution for the blind, such pupil shall be entitled to attend said school for a term not to exceed three years, in addition to the term hereinbefore specified, and the age of such pupil shall not disqualify him or her from receiving such additional instruction preparatory to entrance to a college or higher institution for the blind. All pupils shall freely and equally enjoy all the benefits and privileges of the school, and have the use of the library and books of instruction, and receive tuition, board, washing, lodging, attendance, medical care, etc., without preference or distinction. All pupils shall be treated with the most considerate regard for their misfortune, and always with kindness and humanity, and the board shall carefully enforce this provision.

It shall be the duty of the person sending such blind or partially blind person to such school, to thereupon pay the superintendent of such school an amount of money sufficient to purchase for such pupil a return ticket to its home, and also to deposit with said superintendent the sum of ten dollars additional, which may be used by such superintendent in the purchase of necessary clothing and in defraying other incidental expenses of such pupil; and at the close of the school year, or whenever such pupil ceases to attend such school, it shall be the duty of such superintendent to furnish such pupil a return ticket, and

to return the unexpended balance of such deposit, together with an itemized statement showing all moneys expended by such superintendent for clothing or incidental expenses of such pupil, as aforesaid.

In case the parent, guardian or custodian of such blind or partially blind person, residing in this state, shall be unable to pay the railroad fare of such person and make the deposit hereinbefore provided for, it shall be the duty of the board of county commissioners of the county in which such person resides to advance and pay such railroad fare and such deposit, upon requisition of the superintendent of said school for the blind, approved by the state board having control of said institution.

3. Sections 571, 572, 573 and 574 of the Political Code of Revised Codes of 1903 of this state, and all acts and parts of acts in conflict with the provisions of this act, are hereby repealed.

4. An emergency is hereby declared to exist, and this act shall take effect and be in force on and after its passage and approval.

Approved February 21, 1913.

TENNESSEE.

An Act of January 29, 1844.

An act to aid in the establishment of an institution for the instruction of the blind, deaf and dumb.

Section 1. Be it enacted by the General Assembly of the state of Tennessee, that it shall be the duty of the Governor, immediately after the passage of this act, and ever thereafter on the first day of January, to appoint three persons who shall act as trustees of an institution to be established in the town of Nashville for the instruction of the blind, and that said trustees shall hold their offices for the term of two years, and until their successors are appointed, and shall receive all moneys, whether appropriated by the state or raised by private or individual contribution, for the use and benefit of said institution; and to deposit such money for safe keeping with the cashier of the Bank of Tennessee at Nashville, which officer is hereby made treasurer of said institution, and responsible for the safe keeping of its funds, in the same manner and under the same penalties as are now provided by law to insure the faithful performance of other official duties; and said trustee shall also disburse said moneys in accordance with the directions of the General Assembly, and in the mode best calculated to effect the object of said institution.

Sec. 2. Be it enacted, that it shall be the duty of said cashier of the said Bank of Tennessee at Nashville to settle his whole account with said institution with the comptroller of the state, in the month of December in each year; and that said cashier shall pay no money in discharge of any claim against the said institution unless upon an order signed by a majority of the board of trustees named in the preceding section.

Sec. 3. Be it enacted, that the sum of fifteen hundred dollars be appropriated annually for the benefit of said institution and that said sum shall be paid on the order of a majority of the said board of trustees to the said treasurer, out of the moneys in the treasury of the state not otherwise appropriated; and the said board of trustees shall, during the first week of the regular session of each General Assembly,

make a report to that body setting forth a statement of all their official acts, and giving an account of the condition and progress of the institution, and making such suggestions in regard to its future management as they think will tend to promote and increase its usefulness and efficiency as a scheme of benevolence; provided the traveling expenses of the pupils in coming to the seminary whose parents are poor and unable to pay the same, may be paid out of the money appropriated by this act; provided, that no allowance shall be made for a less distance than one hundred miles.

Sec. 4. Be it enacted, that the sum of one thousand dollars be and the same is hereby appropriated out of any money in the treasury not otherwise appropriated, for the purpose of establishing in the city of Knoxville an institution for the education of the deaf and dumb, which institution shall be conducted under like provisions as are prescribed by this act for the Institution for the Instruction of the Blind.

Sec. 5. Be it enacted, that the money hereby appropriated shall be applied to the necessary expenses in carrying on the schools; but nothing herein contained shall authorize the trustees to apply any portion thereof to the purchase of real estate or erecting buildings thereon; provided, that nothing in this act shall prevent the trustees from purchasing a site and erecting the necessary buildings, if the same can be done upon private contributions.

D. L. BARRINGER,

Speaker of the House of Representatives.

L. M. ANDERSON,

Speaker of the Senate.

JOHN S. YOUNG,

Secretary of State.

Passed January 29, 1844.

A true copy.

TENNESSEE.

House Bill No. 275.

An act to create a state board of control to manage and govern the penal, reformatory and charitable institutions controlled and operated by the state.

Section 1. Be it enacted by the General Assembly of the state of Tennessee, that the intent and purpose of this act are to provide humane and scientific treatment and care and the highest attainable degree of individual development for the dependent wards of the state.

Sec. 5. Be it further enacted, that the board shall have full power to manage and govern the following institutions, The Tennessee School for the Blind.

Senate Bill No. 848.

An Act to provide for the care, maintenance and education of blind children of school age, who are not eligible to the state school for the blind for lack of training, where the parents of such child have not sufficient means to properly care for the child.

Section 1. Be it enacted by the General Assembly of the state of Tennessee, that the state board of education shall have the power to provide for the suitable care, maintenance and instruction of blind

children of school age, who are not eligible to the Tennessee School for the Blind for lack of training and who need special kindergarten training to prepare them for admission in said school for the blind, residing in the state, who may be born blind or become blind, in any case where by lack of means the parent or parents of such children are unable to properly care for, maintain and educate such children.

TENNESSEE.

686. 598. *Poll Tax, who is liable to.* Every made inhabitant over the age of twenty-one and under fifty years, except persons who are deaf, dumb, blind or incapable of labor, shall pay a poll tax for school purposes, and no others. (1895, ch. 120, sec. 67).

1254. *Assistance to physically disabled voters.* Any voter who declares to the officer holding the election that, by reason of blindness or other physical disability, he is unable to mark his ballot, shall, upon request, receive the assistance of the officer holding the election in the marking thereof, and such officer shall certify on the outside that it was so marked with his assistance and shall give no information in regard to the same. (Ex. Ses. 1890, ch. 24, sec. 16).

Of the Institution for the Blind.

2643. (1565) 2072. *Blind school, corporation.* The institution for the instruction of the blind, now in existence and operation in the city of Nashville, shall continue to be a body corporate, by the name of the "Tennessee School for the Blind." (1845-46, ch. 157, sec. 1. 1870, ch. 54, sec. 10).

2644. (1566) 2073. *Corporators.* There shall be seven trustees; and the trustees and their successors, to be appointed by themselves, subject to confirmation by the legislature, shall be the constituents of the said corporation, and shall have perpetual succession. (1859-60, ch. 123, sec. 2).

2645. (1567) 2074. *Rights of corporation.* The said corporation shall have the right—

(1) To sue in equity.

(2) To take and hold property, real and personal, for its use and benefit as a school.

(3) To have a seal and such corporate rights and powers as are necessary and proper to effect the end of its creation—the education of the blind.

2646. (1568) 2075. *Liabilities.* And it shall be subject to be sued in law or equity, and to all liabilities to which corporations are subject.

2647 (1569) 2076. *Power of board of trustees.* The board of trustees shall have power—

(1) To appoint and remove all the officers and teachers of said school.

(2) To prescribe the salaries of said officers and teachers.

(3) To make such by-laws and regulations as they may deem necessary and proper for the control and regulation of the school.

(4) To control and manage the household and domestic affairs, and all the departments of the institution; and, generally,

(5) To exercise such authority as is necessary and proper to conduct such an institution.

(6) (1579a) to adopt such measures in establishing a work department and in boarding the adult blind, as they deem the interests of the institution under their charge demand; but they shall not expend for any pupil more than the amount now annually appropriated for each pupil of said school. (1859-60, ch. 123, sec. 3).

2648. (1579b) 2077. *May employ and discharge, but not increase salaries.* The superintendent and a committee of two of the trustees of said school shall employ and discharge all persons connected with it, but shall not increase the salary of any person without the consent of the board of trustees. (Id., sec. 4).

2649. (1579) 2078. *Report to assembly.* The trustees shall, during the first week of each regular session of the general assembly, make a report to the same, setting forth a statement of all their official acts, and giving an account of the condition and progress of the institution, and making such suggestions in regard to its future management as they think will tend to promote and to increase its usefulness and efficiency as a scheme of benevolence.

2650. (1570) 2079. *Property of the state.* The lot and building and appurtenances of the said school are the property of the state of Tennessee, and the same are committed to the said trustees, to be employed by them as an asylum and school for the blind, who may be admitted to the same.

2651. (1571) 2080. *Education of pupils.* The pupils of said school shall be taught such branches of learning as they can acquire, and as are usually taught to young persons, and such trades and handicraft pursuits as the blind can learn and practice and (to) advantage.

2652. (1572) 2081. *Admission of free pupils.* Two free pupils shall be admitted into the school from each senatorial district, to be selected from amongst indigent persons that are unable to bear the expense of education, by the senator and representative, for the time being, of each district.

2653. 2082. *Deaf, dumb and blind.* Any deaf, dumb and blind child, whose parents are citizens of this state, may be placed in either of the Tennessee School for the Blind, or the Tennessee Deaf and Dumb School, free of charge. (1859-60, ch. 19, sec. 1, 1877, ch. 49, sec. 1).

2654. (1573) 2083. *Other pupils.* All other pupils shall be admitted by the board of trustees upon such terms as they may deem proper; but pupils that cannot pay shall have preference over those whose parents or families are able to provide for them.

2655. (1574) 2084. *Allowance for pupils.* The allowance for pauper pupils admitted into this institution shall be paid quarterly, upon the certificate of the principal of the school or the treasurer of the board of trustees. (1859-60, ch. 69, sec. 2; 1866-67, ch. 42).

2656. (1575) 2085. *Traveling expenses.* The traveling expenses of pupils in coming to the school, whose parents are poor and unable to pay, shall be paid by the trustees, but not for a shorter distance than one hundred miles; and the terms of admission for colored students given separate accommodations, shall be the same as prescribed for white students. (1843-44, ch. 195, sec. 3; 1881, ch. 109, sec. 3).

2657. (1576) 2086. *Pupils from abroad.* When there is room to accommodate them, without excluding pupils of this state, pupils from other states may be admitted by the trustees, if their annual expenses are advanced or placed under the control of the trustees.

2658. 2087. *Donations.* The trustees of any asylum or school heretofore incorporated in the state of Tennessee for the education of the blind, are hereby authorized to accept any grant, deed or conveyance of real estate, gift or appropriation of personal property which may be granted, deeded, conveyed, given or appropriated to them for the use and benefit of such institution, and the same shall be subject to them and their successors' control, jointly and in connection with any gift or allowance made to them by the state. (1871, ch. 121, sec. 1).

2659. 2086. *To be used free of charge.* Any and all property, real and personal, so granted, deeded, conveyed, given, donated or appropriated, shall be perpetually used and enjoyed by the blind of the state free of all charge, but upon such terms of admission, as to the number, age or sex, as the board may adopt, or the general assembly prescribe, from time to time. (Id., sec. 2).

TENNESSEE.

Senate Bill No. 848 (1915).

An act to provide for the care, maintenance and education of blind children of school age, who are not eligible to the state school for the blind for lack of training, where the parents of such child have not sufficient means to properly care for such child.

Section 1. Be it enacted by the General Assembly of the State of Tennessee, that the state board of education shall have the power to provide for the suitable care, maintenance and instruction of blind children of school age, who are not eligible to the Tennessee School for the Blind for lack of training, and who need special kindergarten training to prepare them for admission in said school for the blind, residing in this state, who may be born blind or become blind, in any case where by reason of lack of means the parent or parents of such children are unable to properly care for, maintain and educate such children.

Sec. 2. Be it further enacted, that for the purpose of providing such care, maintenance and education, the said board of education shall have power to contract with any institution having of furnishing facilities for such care, maintenance and education in this or any other state at a contract price to be agreed upon, not exceeding one dollar (\$1.00) per day; providing that such contract shall continue in force and the care, maintenance and education provided therein shall continue until such child attains the age of 12 years, or becomes eligible for the state school for the blind, or until in the judgment of said board the said child will not be able to qualify for said state school; providing, that said state board may in its discretion continue such contract in force until such child attains the age of sixteen years.

Sec. 3. Be it further enacted, that there shall not be used in any one year for the enforcement of this act more than two thousand five hundred dollars, and that the same shall be paid by the comptroller of the treasury of the state of Tennessee upon the order of the state

board of education, through its president and secretary, and that said money shall be paid out of the general school fund of the state.

Sec. 4. Be it further enacted, that nothing in this act contained shall be deemed to repeal or in any way modify any existing law with reference to the education of the deaf, dumb and blind.

Sec. 5. Be it further enacted, that this act take effect from and after its passage, the public welfare requiring it.

Passed 4-3-15.

TENNESSEE.

1916.

A bill to be entitled, a bill to provide a register of the blind persons within the state; to provide a school or schools for training and employing blind persons; including temporary subsistence, and to provide for the sale of products of the training workshops; to provide for the appointment of officers and agents and for their compensation; to provide for the appointment of a commission and for their expenses, and to appropriate funds for the work of the commission and to regulate the disbursement thereof.

Section 1. Be it enacted by the General Assembly of the State of Tennessee, that there is hereby established a state board to be known as the Tennessee Commission for the Blind, consisting of three persons to be appointed by the Governor, one of whom shall be appointed for two years, one for three years, and one for four years. Subsequent members to be appointed for the full term of four years.

Sec. 2. Be it further enacted, that said commission shall prepare and maintain a register of the blind in Tennessee, which shall describe their condition, cause of blindness and capacity for education and industrial training.

Sec. 3. Be it further enacted, that said commission shall act as a bureau of information and industrial aid to aid the blind in finding employment and develop home industry.

Sec. 4. Be it further enacted, that said commission, with the consent of the Governor, shall establish one or more schools for industrial training and workshops, and shall equip the said school or schools and maintain the same, to pay employees suitable wages and to devise means for the sale of products.

Sec. 5. Be it further enacted, that said commission is hereby authorized to receive into these schools pupils from other states upon the payment of such fees as the board may determine.

Sec. 6. Be it further enacted, that said commission may temporarily provide board and lodging for workmen or pupils received at any industrial school or workshop established by it, and to devise means to facilitate the circulation of books and prompt visits among the aged or helpless blind in their homes, and by any other method that may seem to it expedient, provided it shall not take the permanent support of any blind person.

Sec. 7. Be it further enacted, that said commission, with the approval of the Governor, is hereby authorized and empowered to appoint and fix the compensation of such officers and agents as may be necessary, with a single proviso that no person employed by the board shall be a member thereof. Members of the board will not be allowed

any compensation for their services, but their traveling and other necessary expenses are to be paid.

Sec. 8. Be it further enacted, that the sum of ten thousand dollars (\$10,000) be and the same is hereby appropriated out of the funds of the state treasury, to carry out the purposes and objects of this act, said funds to be expended by the said commission created by this act; and all bills or accounts shall be allowed or paid only upon written order, signed by at least two of the members of said commission, directing the comptroller to draw his warrant on the treasurer of the state for the amount so approved and allowed.

Sec. 9. Be it further enacted, that this act shall take effect from and after its passage, the public welfare requiring it.

TEXAS.

1914.

Article 171. *Board of Trustees.* The general control, management and direction of the affairs, property and business of the blind asylum, the deaf and dumb asylum, the orphan asylum, the Confederate home, the deaf, dumb and blind asylum for colored youths, and the epileptic colony, shall be vested in a board of trustees for each, to be styled the board of trustees of said several asylums. The provisions of this chapter shall apply to each of said asylums, except where they conflict with special provisions relating to particular asylums.

Art. 172. *Organization of Boards.* The Governor shall appoint a board of trustees for each, consisting of five members each, who shall hold their office for two years, or until their successors are appointed and qualified; and, whenever a vacancy occurs in said board, it shall be filled by the Governor, and the term of office of the persons so appointed shall be for the unexpired term of the person whose place is made vacant. The appointment of said board shall be by and with the advice and consent of the senate.

Art. 173. *How constituted.* Each board of trustees shall choose one of its members as president; and the superintendent of the asylum to which it pertains shall be ex-officio the secretary of the board, and shall keep a true record of all its acts and proceedings. A majority of each board shall constitute a quorum for the transaction of any business.

Art. 174. *Meetings of the Boards.* The boards of trustees shall hold monthly meetings at their respective asylums, and at such other times as they may be called together by their president, or the by-laws of the institution may prescribe.

Art. 175. *Powers of the Boards.* The boards of trustees shall have power: 1. To examine and pass upon all accounts and expenditures of the superintendent and to approve or disapprove the same. (2) To make all contracts and necessary arrangements for the erection of any buildings, or the making of any improvements upon the grounds of the asylum.

Art. 176. *May make requisition for improvement.* All moneys appropriated by the legislature for the erection of buildings, or the making of improvements upon the grounds of an asylum, shall be subject to requisition by the board of trustees of such asylum, for the

amount actually necessary to pay for such building or improvements; but no money shall be paid except it be upon estimate of completed work, furnished by the contractor, and approved by the architect and board of trustees; provided, that in no case shall more than three-fourths of the actual cost of building and improvements be paid until the work is completed and accepted.

Art. 177. *Statement and Itemized Accounts.* In cases provided for in the preceding article, the board of trustees shall file with the comptroller a statement of the work done, together with an itemized account of the costs of the same, and thereafter the comptroller shall draw his warrant upon the treasurer, in favor of such board of trustees, for the amount specified.

Art. 178. *Duplicate receipts to be taken.* The board of trustees shall take receipts in duplicate for all moneys paid out under the two preceding articles, one of which shall be filed with the comptroller of public accounts.

Art. 179. *Reports of the Trustees.* On the first of January of each year the board of trustees shall report in writing to the legislature the general operations of their respective asylums for the past two years, and accompanying the same with such suggestions as they may deem important to the welfare of the institution.

Art. -80. *Compensation of trustees.* The members of the respective boards shall be paid five dollars each per day and mileage at the rate of three cents per mile, in going to and returning from their respective asylums, for their services in attending the monthly meetings provided for in article 174; provided, that no member shall draw pay for said monthly meetings unless he shall have actually attended said meeting; and provided further, that no member can draw pay under this article for more than one day's attendance upon said monthly meeting; and the certificate of the president of the board approved by the superintendent, shall be sufficient evidence upon which the comptroller can draw a warrant upon the treasurer of the state to pay the amount provided for in this article.

Art. 181. *Superintendent, appointment and term of office.* The board of trustees of said asylums, respectively, shall elect a superintendent of each of said asylums, who shall hold his office for the period of two years. Each of said superintendents shall have had special advantages and practical experience in the management of the persons committed to his charge by virtue of his appointment.

Art. 182. *Oath and bond.* The superintendent of each of said asylums shall within twenty days after notification of his appointment, enter into bond in the sum of ten thousand dollars, payable to the state, with two or more good and sufficient sureties to be approved by the Governor, conditioned for the faithful performance of all the duties of said office; and shall also take the oath prescribed by the constitution, which oath and bond shall be filed in the office of the secretary of state.

Art. 183. *Removal of superintendents.* The board of trustees of each of said asylums shall have the power to remove the superintendents for good cause only.

Art. 184. *Powers of superintendent.* The superintendent shall be the administrative head of the asylum for which he is appointed, and shall have power,

1. To establish such rules and regulations for the government of the institution as, in his judgment, will best promote the interest and welfare of all who may be placed in his charge.

2. Where not otherwise provided by law, to appoint the subordinate officers, the necessary number of teachers and all other employes, and, subject to the approval of the board of trustees, to fix their salaries.

3. To remove at his discretion any officer, teacher or employe who does not discharge his duty, or whose conduct may be such as to endanger the morals of the pupils or the best interests of the asylum.

Art. 185. *Same subject.* The superintendent shall also have the care and custody of the buildings, grounds, furniture and other property pertaining to the asylum and shall act as general financier and purchasing agent of the asylum for all supplies not furnished by contract in accordance with the provisions of chapter 1 of title 125.

Art. 186. *Reports of receipts and expenditures.* At each regular meeting of the board of trustees, the superintendent shall present an itemized account of all receipts and expenditures by him on account of the asylum, which account shall be verified by his own affidavit; and for any other expenses than the expenses provided for in chapter one of title 125, the comptroller shall not draw his warrant upon the treasurer unless the account upon which such warrant is drawn is certified as correct and just by the superintendent and is approved by the president of the board of trustees.

Art. 187. *Reports of superintendent.* On the first days of January and July of each year the superintendent of each asylum shall report to the Governor, under oath, a full statement of all moneys and choses in action received by him and disbursed or otherwise disposed of; and on the first day of November of each year he shall make his annual report to the Governor, showing in detail the operations of the institutions for the year, accompanied with such suggestions and recommendations as he may deem important to the well being of the institution over which he presides.

11. *Particular Provisions. Blind Asylum.*

Art. 188. *Appointment of oculist and qualifications.* The board of trustees and the superintendent shall appoint an oculist for the blind asylum, who shall be skilled in his profession and a married man, and who shall attend regularly at the asylum and administer treatment to all cases of blindness among its pupils deemed curable.

Art. 189. *Removal of oculist.* The oculist shall hold his office for the period of two years, and the board of managers and the superintendent may remove him for good causes only.

TEXAS.

1915.

Be it enacted by the Legislature of the State of Texas:

Section 1. That a new building site shall be acquired as a site of the Texas School for the Blind, consisting of not less than forty acres of land, and modern and commodious buildings shall be erected thereon,

as nearly fireproof as possible, with such other improvements and equipment as may be necessary for a first-class school for the blind, and the name of this new institution shall hereafter be known as the "Texas School for the Blind" (this is in addition to the present blind institute). Before the purchase of said land it shall be the duty of the attorney general to examine and pass upon the title to same.

Sec. 2. That the board of trustees of the blind asylum shall become and be known as the "Board of Trustees of the Texas School for the Blind," and as such shall continue to act for the unexpired parts of their respective terms for which they are appointed, and whenever any duty, power or function is by law, or may hereafter be by law placed upon the board of trustees of said blind asylum, the same shall be construed to be placed upon and shall be executed by the board of trustees of the Texas School for the Blind.

Sec. 3. The governor, the lieutenant governor and the attorney general of Texas shall constitute a board whose duty it shall be to carry out the provisions of this act, of which board the Governor shall be chairman and the superintendent of the Texas School for the Blind shall be secretary of said board.

Sec. 4. The board provided for herein shall take the title to any real estate acquired under this act to "The Board of Trustees of the Texas School for the Blind" and their successors, as trustees for the use and benefit of the State of Texas.

Sec. 5. That for the purpose of carrying out the provisions of this act there shall be appropriated out of the general revenues of the state not otherwise appropriated the sum of two hundred and twenty-five thousand dollars (\$225,000) for use during the fiscal year ending August 31, 1916, and the sum of seventy-five thousand dollars (\$75,000) for use during the fiscal year ending August 31, 1917.

Sec. 6. The terrible danger from fire, the insufficient accommodations now at the building for the blind children of the state, and the crowded condition of the calendar creates an emergency and an imperative public necessity that the constitutional rule requiring bills to be read on three several days in each house be and the same is hereby suspended and this bill shall become a law from and after its passage.

Approved June 3, 1915.

UTAH.

Compulsory Education.

1907.

Every parent, guardian or other person having control of any blind child between the ages of 8 and 18 years, who on account of its defective sight is unable to be educated in the public schools, must send such child to the state school for the blind for at least six months of each school year. The parent or other person is excused from this duty if it can be shown to the satisfaction of the board of trustees of the school that the child is taught at home by a competent teacher in the same branches and for the same length of time as children are in the state school, or that such child has already acquired the branches of learning taught in the state school, or that the child is in such physical

condition or mental condition as to render attendance inexpedient or impracticable. The failure to comply with this provision, after the proper person has been notified of its requirements, constitutes a misdemeanor.

The county school superintendents must include in their annual school census the list of persons between the ages of 5 and 30 years who are too blind to obtain an education in the public schools, their names and addresses, and the names of their parents.

UTAH.

1913.

Sec. 10. *Institutions for deaf, dumb and blind.* Institutions for the deaf and dumb, and for the blind, are hereby established. All property belonging to the school for the deaf and dumb, heretofore connected with the University of Utah, shall be transferred to said institution for the deaf and dumb. All the proceeds of the lands granted by the United States for the support of a deaf and dumb asylum and for an institution for the blind, shall be a perpetual fund for the maintenance of said institutions. It shall be a trust fund, the principal of which shall remain inviolate, guaranteed by the state against loss by diversion.

UTAH.

(Abstract taken from the last United States Census.)

School for the Blind.

1907.

The government and control of the Utah School for the Blind is vested in a board of trustees consisting of the attorney general and five resident citizens of the state, not more than three of whom may be members of the same political party, appointed by the Governor with the consent of the senate. The citizen members of the board serve for six years and receive no compensation other than actual expenses.

The purpose of the school is to provide a practical education for the blind of the state who are of sound mind and body, under 30 years of age, capable of receiving beneficial instruction, and incapacitated, on account of blindness or inability to see, for instruction in the common schools; to instruct such pupils in those mechanical trades and arts that tend to enable them to become self-supporting and useful citizens; and to provide a circulating library for the blind of the state. All blind residents of the state under 30 years of age are entitled to the benefits of the school free of charge. In all cases where an applicant or an inmate of the school is too poor to pay for necessary clothing and transportation expenses, the county commissioners of his residence, after ascertaining that such facts are true, must pay the expenses. Pupils from other states may be received and instructed on such terms as the board may prescribe.

Commission for the Adult Blind.

1910.

The Utah commission for the adult blind consists of five members; the Governor is president of the board and the other four members are appointed by the Governor with the consent of the senate. The mem-

bers serve for terms of four years and receive no compensation other than actual expenses. The duties and powers of the commission are to prepare and maintain a descriptive register of the adult blind of the state; to establish, equip and maintain within the state one or more workshops for the industrial training and employment of the adult blind; to maintain a bureau of information, the object of which is to assist in the finding of employment and in the development of home industries for the adult blind; to furnish materials and tools to them either in their homes or in the workshops maintained by the board, and to assist them in marketing their handiwork and products. It ameliorates their condition by promoting visits among the aged or helpless adult blind in their homes and by such other methods as it thinks expedient. The commission may provide for temporary lodging and support of blind persons engaged in any workshop, but must not undertake their permanent support or maintenance. Adult blind persons from other states may be admitted in the workshops upon payment of such fees as the commission may prescribe.

VERMONT.

From Public Acts, State of Vermont, 1910.

No. 74.

Sec. 1. The sum of fifty thousand dollars, payable five thousand dollars October 1, 1911, five thousand dollars October 1, 1912, ten thousand dollars October 1, 1913, ten thousand dollars October 1, 1914, ten thousand dollars October 1, 1915, and ten thousand dollars October 1, 1916, is hereby appropriated for the Austine Institution, a corporation organized and existing under and by virtue of No. 276 of the Acts of 1904, as amended by No. 319 of the Acts of 1908, for the purpose of erecting a suitable building or plant for the use of said corporation, upon land owned by it in Brattleboro, Vermont, subject to the conditions provided in the following sections; and the auditor of accounts is hereby directed to draw an order for that amount in favor of said Austine Institution.

Sec. 6. Public Statutes section 1169 is hereby amended so as to read as follows:

Sec. 1169. The blind at the New England Institute for the instruction of the blind at Boston, Mass.

No. 77.

Sec. 1. Any deaf or blind child who is within the age of legal pupils, as defined by section 1027 of the Public Statutes as amended by section 1 of No. 69 of the Acts of 1910, and who is designated by the Governor to any institution for the education of the deaf and blind in this state, under the provisions of chapter 60 of the Public Statutes and amendments thereto, shall attend such designated school during its regular sessions for a period for which such child is designated unless such child is mentally or physically unable to so attend or has already acquired knowledge of the branches required to be taught in the public schools or is otherwise being furnished with the same education, provided that said child shall not be required to attend more than forty weeks in any school year.

Sec. 2. A parent or guardian who neglects or refuses to permit a child to receive instruction, as specified in section 1 of this act, shall be fined not more than twenty-five dollars, nor less than five dollars, which shall be paid to the town where said parent or guardian resides. Justices and municipal courts shall have concurrent jurisdiction with the county court of offenses arising under this act, and all the provisions of chapter 49 of the Public Statutes, relating to complaint and prosecution, shall apply to this act.

Approved March 18, 1915.

No. 69. *An Act in Amendment of the Laws Relating to School Attendance and Child Employment.*

It is hereby enacted by the General Assembly of the State of Vermont:

Sec. 1. Section 1027 of the Public Statutes is hereby amended so as to read as follows:

Sec. 1027. The words "legal pupils" shall include persons between the ages of five and eighteen years, but no person over five years of age shall be deprived of public school advantages on account of age. No child under five years of age shall be received into a public school except in a kindergarten; and no child under seven years of age shall be received into a public school except a kindergarten after the beginning of the fall term, unless said child has the written permission of the town or union superintendent.

VERMONT.

NO. 276—AN ACT TO INCORPORATE "THE AUSTINE SANITARIUM."

Sec.

1. Incorporators.
2. Powers, disposition of income.
3. By-laws.
4. Trustees.

Sec.

5. Books of account.
6. First meeting.
7. Exemption for taxation.
8. Subject to future legislation.

Section 1. It is hereby enacted by the General Assembly of the State of Vermont, that George F. Gale, M. D., A. I. Miller, M. D., George R. Anderson, M. D., Charles A. Miles, George C. Averill and William H. Vinton, first selectmen of the town of Brattleboro. and their successors appointed as hereinafter directed, be and they hereby are, incorporated and made a body politic and corporate by the name of "The Austine Sanitarium," with all the powers and privileges incident to such corporations, and by that name may sue and be sued, plead and be impleaded, appear, prosecute and defend in all suits and actions, and shall have and use a common seal to be by them devised, altered and renewed, at their pleasure.

Sec. 2. It is hereby further enacted that the said corporation may take and receive, hold, purchase and possess, of and from all persons disposed to aid the benevolent purposes of said institution, any grants and devise of lands and tenements, in fee simple or otherwise. and any donations and bequests, and subscriptions of money or other property, to be used and improved for the erection, support and maintenance of a sanitarium as aforesaid, provided the net income of said corporation from its real and personal estate does not exceed the

sum of twenty thousand dollars per annum. All profit, interest and income which may come to this corporation either in the way of operation of the said sanitarium or from any fund, endowment or other source, shall be used for the purpose of this corporation and no dividend, endowment or profit shall be received by or paid to any member of this corporation, except that any director or officer thereof may receive reasonable compensation for service actually performed.

Sec. 3. It is hereby further enacted, that said corporation may from time to time make and establish such by-laws and regulations for the internal government and economy of said sanitarium as they may think proper, not repugnant to the constitution and laws of this, or the United States; and may at any meeting thereof, duly warned, choose all necessary and convenient officers, who shall have such power and authority and be elected in such manner and for such period of time as the said corporation by their by-laws shall limit and direct.

Sec. 4. It is hereby further enacted that the said George F. Gale, M. D., A. I. Miller, M. D., George R. Anderson, M. D., Charles A. Miles, George C. Averill and W H Vinton, the first selectmen of the town of Brattleboro, and their successors, not exceeding at any time six in number, shall be a board of trustees. and shall have sole superintendence, management and control of said sanitarium, and in case of the decease, resignation or removal of one or more of said trustees, the survivors shall from time to time, fill all such vacancies.

Sec. 5. It is hereby further enacted that after the organization of said corporation, the said trustees shall keep, or cause to be kept, just and true books of account of all the transactions of said corporation, and shall therein enter all the funds, donations, receipts and expenditures thereof. And in the event that patients are received in said sanitarium sent there by the state of Vermont, or towns in said state and there supported at the expense of such state or towns, then and in that event said books shall at all times be open for the inspection of the board of visitors, nominated or appointed by or at the direction of the State of Vermont; and if patients are so received from the state or towns and supported at the expense of the state or towns, then said trustees shall make an annual report to the general assembly of the amount of funds of said sanitarium, the receipts and expenditures thereof, the number of patients admitted and discharged, the number cured, the state of others discharged or remaining, and such other information as may be necessary to show the effects and operations of said sanitarium.

Sec. 6. It is hereby further enacted that the said George F. Gale and upon his neglect and other members of said corporation, may call the first meeting thereof by giving notice of the time and place of holding the same. in some one of the newspapers printed in the county of Windham, at least six days previous to said meeting, and all other meetings of said corporation shall be warned and holden in the manner provided by the **by-laws thereof.**

Sec. 7. It is hereby further enacted, that the estate, both real and personal, and all other of the funds of said institution shall at all times hereafter be exempt from all taxes.

Sec. 8. It is hereby further enacted that any further legislature shall have power to modify, alter and amend this act, so far as to provide for the more perfect and effectual accomplishment of the objects of this act.

Approved December 8, 1904.

NO. 319. AN ACT TO AMEND NO. 276 OF THE ACTS OF 1904, ENTITLED "AN ACT TO INCORPORATE THE AUSTINE SANITARIUM."

It is hereby enacted by the General Assembly of the State of Vermont:

Section 1. The name of the corporation "The Austine Sanitarium," chartered by No. 276 of the acts of 1904, may be changed to any other name, not in use by any other corporation in the state, at any time, by the unanimous action of the board of trustees. In case of such change of name, a certificate thereof, signed by all the members of the board of trustees shall be filed with the secretary of state, and upon the filing thereof the name shall be changed according to such certificate.

Sec. 2. Said corporation, by its board of trustees, may, in addition to or in lieu of the authority vested in it by No. 276 of the acts of 1904, establish, maintain and carry on, under the provisions of said act, an institution or establishment for the care, education and training of unfortunate or defective persons; and all provisions of No. 276 of the acts of 1904 shall be construed as amended hereby so far as the same are inconsistent with this act.

Sec. 3. This act shall take effect from its passage.

Approved November 20, 1908.

APPROPRIATIONS TO AUSTINE INSTITUTION FOR A BUILDING, 1910-1916.

No. 74—*An Act Providing for the Care and Education of Defective Children.*

It is hereby enacted by the General Assembly of the State of Vermont:

Section 1. The sum of fifty thousand dollars payable, five thousand dollars October 1, 1911, five thousand dollars October 1, 1912, ten thousand dollars October 1, 1913, ten thousand dollars October 1, 1914, ten thousand dollars October 1, 1915, and ten thousand dollars October 1, 1916, is hereby appropriated to the Austine Institution, a corporation organized and existing under and by virtue of No. 276 of the acts of 1904, as amended by No. 319 of the acts of 1908, for the purpose of erecting a suitable building or plant for the use of said corporation, upon the land owned by it in Brattleboro, Vermont, subject to the conditions provided in the following sections; and the auditor of accounts is hereby directed to draw an order for that amount in favor of said Austine Institution.

Sec. 2. The appropriation specified in the preceding section is made upon condition that said Austine Institution shall bind itself by a contract to the satisfaction of the Governor, that it will at all times receive, take, instruct and care for, at actual cost, all such deaf and

dumb children as the Governor may designate under chapter 169 of the Public Statutes, to be received by said corporation.

Sec. 3. Said Austine Institution shall be subject to visitation and inspection by the board of visitors to state institutions, provided for by section 6017 of the Public Statutes; and said board shall include in its biennial report a statement of the names and ages of such children as may be received by said institution under the provisions of the second preceding section, and it shall report fully as to the condition and progress of such children, with such recommendations in regard to the management of the institution as it may deem proper.

Sec. 4. The income of the fund of fifty thousand dollars held by said corporation shall be devoted exclusively by the trustees thereof in the manner and for the purposes set forth in a decree of the court of chancery for the county of Windham, in the matter of the will of William Austine, rendered at the April term, 1910, of said court of chancery.

Sec. 5. The appropriation provided for in section one is made upon condition that the amount thereof shall be used exclusively for the purposes stated in this act, and if said institution shall cease to exist, the real and personal estate of said corporation shall be held as security to the state for the amount so appropriated and may be sold under direction of the legislature for the purpose of reimbursing the state for the amount herein appropriated; and the said real estate of said corporation shall at no time be sold by the trustees thereof without consent of the legislature.

Sec. 6. Public Statutes section 1169 is hereby amended so as to read as follows:

Section 1169. *Institutions for instruction.* The beneficiaries specified in this chapter shall be instructed in the following institutions: The deaf and dumb at the American Asylum for the education of the Deaf and Dumb at Hartford, Conn., the Clerk for the Deaf at Northampton, Mass., the Mystic Oral School at Mystic, Conn., or the Austine Institution at Brattleboro, Vermont; the blind at the New England Institute for the Instruction of the Blind at Boston, Mass., and the idiotic or feeble-minded children at the Massachusetts School for the Idiotic and Feeble-Minded Youth at Boston, or at such other institutions of like nature as the Governor may select.

Sec. 7. This act shall take effect from its passage.

Approved January 27, 1911.

No. 275. *An Act to Provide for the Completion and Equipment of the Austine Institution.*

It is hereby enacted by the General Assembly of the State of Vermont:

Section 1. The sum of twenty-five thousand dollars, ten thousand dollars payable July 1st, 1913; five thousand dollars payable July 1st, 1914; five thousand dollars payable July 1st, 1915, and five thousand dollars payable July 1st, 1916, is hereby appropriated for the purpose of paying the balance of the expense of completing and equipping the building of the Austine Institution, in excess of the appropriation made in 1910.

Sec. 2. The auditor of accounts shall draw orders in favor of the

trustees of said institution from time to time, to the total amount provided in section 1 of this act, for the purposes therein specified.

Approved January 28, 1913.

VERMONT.

1915.

From the Public Statutes of Vermont.

Chapter 60.

Sec. 1166. *Governor to be Commissioner.* The Governor shall be, by virtue of his office, commissioner of the deaf, dumb, blind, idiotic, feeble-minded or epileptic children of indigent parents, and, as such commissioner, shall constitute the board for their instruction. 1883, No. 21, No. 2. 1825, No. 31, No. 2.

Sec. 1168. A sum not exceeding twenty thousand dollars is annually appropriated for the benefit of the deaf, dumb, blind, idiotic, feeble-minded or epileptic children of indigent parents to be used agreeably to the provisions of this chapter.

Sec. 1169. (Only such part as relates to the blind). The beneficiaries specified in this chapter shall be instructed in the following institutions: The blind at the New England Institute for the instruction for the blind at Boston, Mass.

Sec. 1170. The board of civil authority in a town shall ascertain and certify to the county clerk, on or before the first day of February, annually, the number of deaf and dumb persons and the number of blind and epileptic persons in such town, their ages, conditions and circumstances, and the ability of their parents to educate them, the names of all idiotic or feeble-minded children between the ages of five and fourteen years residing in such town and the pecuniary ability and circumstances of their parents or the persons bound to support them, and whether, in the opinion of said board, the persons named are proper subjects for the charity of the state, and whether they and their parents or guardians are willing that they should become beneficiaries of any of the institutions provided for the instruction of such persons.

Sec. 1172. The Governor may designate beneficiaries, may direct the auditor of accounts to draw orders for any part of the appropriation provided for in this chapter, may superintend and direct all concerns relating to the education of the deaf, dumb, blind, idiotic, feeble-minded or epileptic children, inhabitants of the state, and may allow all or any portion of the expense of their conveyance to and support in the institutions in which they are instructed, for such time as he deems proper; and he may, in his discretion, take bonds to indemnify the state against expenses which accrue in consequence of the sickness, clothing or transportation of a beneficiary.

Sec. 1173. The selectmen of the several towns may execute in their official capacity in behalf of their respective towns, without a previous vote, the bond which may be required to be given by the town to indemnify the state against expenses which may accrue in consequence of the sickness, clothing or transportation of the deaf, dumb, idiotic, feeble-minded or epileptic beneficiaries from such town.

Sec. 1174. When a person is designated a beneficiary, the town in which he resides shall defray the expenses of his conveyance to and

from the institution in which he is to be instructed, if, in the opinion of the selectmen, his parents or guardian is not able to pay the same.

Sec. 1175. The Governor may designate one or more blind or deaf and dumb beneficiaries, under the provisions of this chapter, who may receive his education within this state, when, in the judgment of the Governor, adequate advantages exist for proper instruction and the public good will be subserved thereby, notwithstanding such beneficiary is over fourteen years of age.

VIRGINIA.

(Abstract taken from the last United States Census.)

Schools for the Blind.

1904.

The government of the Virginia School for the Deaf and Blind is vested in a board of visitors, consisting of six members appointed by the Governor with the consent of the senate for terms of four years, and the superintendent of public instruction. In the institution there is one school for the education of deaf mutes and another school, separate and distinct, for the education of the blind. The pupils of the school are selected, as the board may prescribe, among such persons as are unable to pay for maintenance and support to the extent of the means of the institution, and from other persons, residents of the state, on such terms for their maintenance and support as may be agreed upon;¹ but in no case is there a charge for the education of the pupils.

The Virginia State School for Colored Deaf and Blind Children is under the government of a board of five visitors appointed by the Governor for terms of four years. Any blind child of the colored race whose parents or guardians are residents of the state and who can not be educated in the public schools may be admitted to the school without charge for his education. (Supplement 1910).

Census of the Blind.

1904.

The clerk of each district school board must at the time of taking the school census also take a separate census of the blind persons between the ages of 7 and 20 years residing within the school district, giving the sex, age and residence of each, and return the copy to the district superintendent. The superintendent must consolidate the returns of the county and transmit them to the superintendent of the school for the deaf and blind.

¹According to the superintendent of the Virginia School for the Deaf and the Blind, no charge whatever is made for any of its pupils.

WASHINGTON.

(Abstract taken from the last United States Census.)

School for the Blind.

1913.

The general management and control of the State School for the Blind is vested in the state board of control.

All blind residents of the state between the ages of 6 and 21 years who are free from loathsome and contagious diseases are admitted into the school free. Blind children from other states may be admitted

into the school upon payment in advance of a sufficient amount to cover the cost of their maintenance and education.

Compulsory Education.

1910.

Every parent or guardian having custody of blind children of the prescribed age must send them to the state school for the blind. Upon satisfactory proof and evidence to the county school superintendent that such children are being properly educated at home or in some other suitable institution, the parent may be excused from this duty. If it appears to the satisfaction of the superintendent that the parent is unable to bear the traveling expenses, the county commissioner must pay such expenses. Any person failing to comply with this provision is guilty of a misdemeanor.

The clerks of the school districts must include in their annual report the names of all the blind persons in their district between the ages of 6 and 21 years. This report is transmitted to the county commissioners, state board of control and the superintendent of the state school for the blind.

WEST VIRGINIA.

(Taken from the last United States Census.)

School for the Blind

1913.

The general management and control of the West Virginia School for the Deaf and Blind is vested in the State Board of Control. The board visits the school at least once in every six months, and one member must visit the school once a month. The control of the educational affairs of the school is vested in the state board of regents; this board makes rules and regulations for the management of educational matters, prescribing the course of study to be pursued in the school. The course of instruction must be as extensive in the intellectual, musical and mechanical departments as the capacities and interests of the pupils may require.

All blind residents of the state of sound mind and who are not afflicted with any contagious disease, between the ages of 8 and 25 years, may be admitted to the school on application to the principal. Applicants are admitted in the order of their applications, and the principal must in each case keep a record of the name, dates of admission and discharge, age, address, names of parents or guardians, and degree and cause of the blindness. The pupils may continue in the school for five years, and as much longer as in the discretion of the state board of control and the principal their condition and progress would seem to justify. All such blind persons are admitted without charge for board and tuition, and if the pupil is not provided with clothing while at the school the principal furnishes the clothing of a value not to exceed \$40 and collects the same from the pupil's county of residence.

After all the applicants of the prescribed age have been admitted other blind persons of suitable age to receive any advantage from the school, if there are accommodations, may be admitted to the school upon terms prescribed by the board; but such persons must withdraw

from the school in the order of their admission to make room for new applicants between the ages prescribed. The board provides for accommodations for all other pupils upon such terms of payment as it may prescribe.

The state assessors must register the names of the blind persons in their respective districts, the degrees and cause of blindness, age, names of parents or guardians, address and such other facts as may be useful in making the school efficient in ameliorating the condition of the blind. The assessors' reports are sent to the auditor, who in turn sends them to the principal of the school, who must immediately value not to exceed \$40 and collects the same from the pupil's county admission into the school.

WISCONSIN.

1909.

Education of Blind Children

(Chapter 199, laws of 1909, amending Chapter 551, laws of 1907, creating Section 579 and referring to and including certain sections in Chapter 128, laws of 1907.)

Section 579o. Sections 578, 579a, 579m and 579n of the Statutes, and all acts amendatory thereof, shall, so far as applicable, provide for an application to schools for the blind, except that there shall be paid out of the state treasury annually in the month of July to the treasurer of the school district board, or of the board of education in any city or village maintaining a school or schools for the blind under the charge of one or more teachers, whose qualifications shall be approved by the state superintendent, the sum of two hundred dollars for each blind pupil instructed in such school or schools at least nine months during the year next preceding the first day of July, and a share of such sum proportionate to the term of instruction of any such pupil who shall be so instructed less than nine months during such year; the said sum of two hundred dollars to include instruction in music and manual training, and to cover necessary expenses for material and printing in connection with the work of any such school or schools; and the state superintendent of public instruction may authorize and instruct the inspector of day schools for the deaf, acting under his direction, to inspect day schools for the blind without additional compensation.

Provides for the establishment of public schools for the blind. It appears that these schools may, like the day schools for the deaf, be located in communities where there are enough pupils to justify the organization of such a school. The sections above referred to will be found in the provisions of Chapter 128, printed in this pamphlet. These schools are presumed to be maintained and inspected in the same way that the day schools for the deaf are maintained, inspected and directed.

Pension Law

(In operation since 1907.)

Sec. 572-I. *Twenty-five Dollars Quarterly Aid for Certain Blind.* Any male person over the age of 21 years, and any female person over the age of 18 years, who is declared to be blind in the manner here-

inafter set forth, and who is not an inmate of any charitable, reformatory or penal institution in this state, and who is not receiving aid from the state or any county or city, and who has an income of less than \$250 per annum, and who has been a bona fide resident of this state for ten years and of the county in which such application is made for at least three years next preceding the making of the application hereinafter set forth, may, in the discretion of the county board, receive from the county in which such person or persons are resident, a benefit of one hundred dollars per annum, payable quarterly.

Sec. 572-J. *Examiner of Blind—Records and Fees.* The county board may appoint a regular practicing physician, whose official title shall be "Examiner of the Blind," and whose duty it shall be to examine all applicants for benefit and to endorse on the application a certificate showing whether such person is blind or not, and file the application so endorsed in the office of the county clerk. Such examiner shall keep a register in which he shall enter the name and address of each applicant so examined. Such examiner shall be paid by the county for his services the sum of two dollars for each applicant so examined.

Sec. 572-K. *Affidavits of Facts Entitling.* Any person claiming a benefit as provided herein shall make an affidavit before the county clerk of the county in which he resides of the facts which bring him within the provisions of this act, which affidavit shall be deemed an application for said benefit. Such application shall be accompanied by an affidavit of two freeholders residing in the county, that they are personally acquainted with such applicant and know that he has been a bona fide resident of this state for ten years and of said county for three years immediately preceding the filing of such application.

Sec. 572-L. *Filing of Application.* The county clerk shall, upon receiving such application, file the same with the examiner of the blind.

Sec. 572-M. *County Clerk to Register and Certify.* The county clerk shall register the name and address of each applicant and the date of the examination, and on or before the first day of November of each year he shall certify to the county board of the county the name and address of each applicant who has been found blind by the examiner of the blind.

Sec. 572-N. *County Tax for Blind Relief.* The county board of any county in which such application has been made, may, in its discretion, annually levy a tax upon the taxable property in the county sufficient to pay said benefits to the persons entitled to the same, and who have complied with the provisions of this act.

Sec. 572-O. *False Affidavit Perjury.* Any person who shall make a false affidavit in order to secure the benefit herein provided, shall, upon conviction, be deemed guilty of perjury.

WISCONSIN.

(Abstract taken from the last United States Census.)

School for the Blind.

1915.

The general supervision and government of the State School for the Blind is vested in the state board of control, whose duty it is to inspect the school at least once a month. The object of the school for

the blind is to afford the blind enlightened and practical education, which may aid them to obtain the means of subsistence, discharge the duties of citizens, and secure all the happiness which they are capable of attaining. All blind residents of the state who are of suitable age and capacity to receive instruction are received and taught, and enjoy all the benefits and privileges of pupils free of charge. Blind persons placed in the institution by any municipality of the state, but not entitled to free tuition, enjoy all the benefits and privileges at a cost not exceeding \$100 per scholar for the academic year of 40 weeks, to be paid by such corporation. The school pays for necessary expenses of indigent scholars in going to and from the school. No pupil from without the state may be received to the exclusion of any pupil resident within the state. A library is maintained at the school that is available to all blind citizens of the state.

Instruction and Care for Blind Artisans.

1915.

The state, through the management and supervision of the state board of control, maintains an institution at Milwaukee in which any blind citizen of the state having learned a trade may pursue his vocation on his own account and receive the whole of the proceeds of his labor. The board provides a means of instruction for any adult blind resident of the state who desires to avail himself of the privileges and benefits of the institution. It may furnish artisans at the institution with a limited amount of tools and materials sufficient to meet the requirements of their employment. An allowance of \$75 is made to any indigent blind artisan who is a resident of the state but not a resident of Milwaukee, and the state pays for his expenses in traveling to and from the institution.

The assessors of the state when making their annual assessment must at every tenth year enter upon blanks furnished for this purpose the names of all blind persons in their respective districts, their age, color, occupation and place of birth, whether such persons are educated or not, the names of their parents, the number of children of such parents, what blood relation, if any, existed between the parents, the number of blind children of such parents, and return the same to the county clerk. The county clerk transmits this report to the Secretary of State, who compiles and tabulates such returns for his biennial report.

Compulsory Education.

1915.

Any parent or guardian having under his control a blind child between the ages of 6 and 16 years who is incapacitated for attending a common school, must send such child to some public, private, parochial, or state school for the instruction of the blind, for at least eight months a year. This requirement does not apply to children who are shown by a reputable physician not to be in proper physical or mental condition to attend school. A penalty is provided for failure to comply with this requirement.

Whenever it appears by affidavit to any county or municipal judge that any blind child of proper age is derived of a suitable education

through the neglect or refusal of its parents or guardian, the judge may, in his discretion, if the facts are admitted or established to be true, order such child to be sent to the school for the blind or to some private institution for the instruction and education of the blind. Each superintendent of the city and county schools must send to the superintendent of the school for the blind the names and addresses of the blind persons known to be in his city or county and the persons having charge of them; and the number of blind persons being educated and not educated; and the number of personal visits made during the year to the custodians of the blind children, to induce them to give such children a proper education.

The Blind in Poorhouses.

1915.

It is the duty of the state board of control to investigate as to the number and condition of blind persons supported in the poorhouses of the state.

WYOMING.

(Abstract taken from the last United States Census.)

Education of the Blind.

1910.

The State Board of Charities and Reform is composed of the Governor, the secretary of state, the state treasurer, the state auditor and the state superintendent of public instruction. The board has general supervision of the blind, deaf and dumb institute when it is open, and until the opening of the institute the board provides for the support and education of the blind, deaf and dumb persons residents in the state in some asylum for the education of the blind, deaf and dumb. In selecting the asylum the board must select the one that offers the best advantages for the education of such pupils, due regard being had to economy in the cost of supporting and maintaining pupils at the asylum. All necessary clothing, transportation and other expenses that are incurred in placing pupils in such an asylum must be paid out of the funds appropriated for the blind, deaf and dumb, but when the board is satisfied that the parents or guardians of such children are financially able to bear such expenses they must in all cases do so.

When there are 12 pupils ready that will enter the school the blind, deaf and dumb institute opens, but when the number of pupils falls below eight the institute must close. Every blind, deaf or dumb person who is a resident of the state of suitable age and capacity is entitled to receive an education at the expense of the state, and persons not residents of the state of suitable age and capacity are entitled to an education in the institute upon payment of \$300 per year in advance to the state treasurer.

When the pupils of the institute are not otherwise supplied with clothing they must be furnished with it by the principal. The cost of clothing so supplied is a charge against the county from which the pupils come to the institute, but the county may collect the account from the parent or guardian or from the pupil himself unless it appears by the affidavit of three disinterested citizens of the county, not akin to the pupil, that the pupil or his parents would be unreasonably oppressed by a suit to recover the cost of the clothing.

UNITED STATES.

Forty-fifth Congress. Sess. III.

March 3, 1879. Chap. 186.

An Act to promote the education of the blind.

Whereas, the trustees, superintendents and teachers of the various state and public institutions for the instruction of the blind, representing the interests of over thirty thousand blind persons in the United States, have united in a petition to Congress to take into consideration the needs of the blind in the United States; and

Whereas, the Association of the American Instructors of the Blind, at their session in Philadelphia in August, eighteen hundred and seventy-six, representing twenty-six state and public institutions for the instruction of the blind, have set forth in a series of resolutions that the especial needs of the blind are embossed books and tangible apparatus, and have recommended that if any aid should be given by Congress it would most efficiently come through increasing the means of the American Printing House for the Blind, located in Louisville, Kentucky; and

Whereas, it appears that the Kentucky Legislature, in eighteen hundred and fifty-eight, by an act of special legislation, declared James Guthrie, W. F. Bullock, Theodore S. Bell, Bryce M. Patten, John Milton, H. T. Curd and A. O. Brannin, and their successors, a body corporate under the name and style of the Trustees of the American Printing House for the Blind, with the avowed purpose of printing books and making apparatus for the instruction of the blind of the United States, for general distribution, and for the sake of philanthropy, and with no desire for pecuniary gain; and

Whereas, the states of Louisiana, Mississippi, Tennessee, Kentucky, New Jersey and Delaware have made appropriations for the aid of said American Printing House for the Blind, of which, on account of the outbreak of the civil war, only a small part of the money appropriated by the first three named states was ever available; and

Whereas, by the money from the states of Kentucky, New Jersey and Delaware, a printing house for the blind was established, and is now supplied with presses, type, stereotype foundry, steam-engine, a well equipped bindery, and all the appliances necessary for the manufacture of embossed books, and has for the last ten years been manufacturing embossed books superior in every way to any manufactured elsewhere, which have been distributed gratuitously to the blind in the states of Kentucky, New Jersey and Delaware, by which the blind in those states have been very much benefited; and

Whereas, it is desirable that the blind of the whole country should be equally benefited, and the intentions of the trustees to establish an educational institution of the most practical beneficence and wisest philanthropy upon a national basis should be accomplished, inasmuch as the education of the blind is a subject of national importance; Therefore,

Be it enacted by the Senate and House of Representatives of the United States of America in Congress Assembled, That the sum of two hundred and fifty thousand dollars, out of money in the United States treasury not otherwise appropriated, be, and hereby is, set apart as a

perpetual fund for the purpose of aiding the education of the blind in the United States of America, through the American Printing House for the Blind.

Sec. 2. That the secretary of the Treasury of the United States is hereby directed to hold said sum in trust for the purpose aforesaid; and it shall be his duty, upon the passage of this act, to invest said sum in United States interest-bearing bonds, bearing interest at four per centum, of the issue of July, eighteen hundred and seventy, and upon their maturity to reinvest their proceeds in other United States interest-bearing bonds, and so on forever.

Sec. 3. That the secretary of the Treasury of the United States is hereby authorized to pay over, semi-annually, to the trustees of the American Printing House for the Blind, located in Louisville, Kentucky, and chartered in eighteen hundred and fifty-eight by the legislature of Kentucky, upon the requisition of their president, countersigned by their treasurer, the semi-annual interest upon said bonds, upon the following conditions:

First: The income upon the bonds thus held in trust for the education of the blind shall be expended by the trustees of the American Printing House each year in manufacturing and furnishing embossed books for the blind and tangible apparatus so manufactured and furnished by this income shall each year be distributed among all the public institutions for the education of the blind in the states and territories of the United States and the District of Columbia, upon the requisition of the superintendent of each, duly certified by its board of trustees. The basis of such distribution shall be the total number of pupils in all the public institutions for the education of the blind, to be authenticated in such manner and as often as the trustees of the said American Printing House shall require; and each institution shall receive, in books and apparatus, that portion of the total income of said bonds held by the secretary of the Treasury of the United States in trust for the education of the blind, as is shown by the ratio between the number of pupils in that institution for the education of the blind and the total number of pupils in all the public institutions for the education of the blind, which ratio shall be computed upon the first Monday in January of each year.

Second: No part of the income from said bonds shall be expended in the erection or leasing of buildings.

Third: No profit shall be put on any books or tangible apparatus for the instruction of the blind manufactured or furnished by the trustees of said American Printing House for the Blind, located in Louisville, Kentucky; and the price put upon each article so manufactured or furnished shall only be its actual cost.

Fourth: The secretary of the Treasury of the United States shall have the authority to withhold the income arising from said bonds thus set apart for the education of the blind of the United States whenever he shall receive satisfactory proof that the trustees of said American Printing House for the Blind, located in Louisville, Kentucky, are not using the income from these bonds for the benefit of the blind, in the public institutions for the education of the blind in the United States.

Fifth: Before any money be paid to the treasurer of the American Printing House for the Blind by the secretary of the Treasury of the United States, the treasurer of the American Printing House for the Blind shall execute a bond, with two approved sureties, to the amount of twenty thousand dollars, conditioned that the interest so received shall be expended according to this law and all amendments thereto, which shall be held by the secretary of the Treasury of the United States, and shall be renewed every two years.

Sixth. The superintendent of the various public institutions for the education of the blind in the United States shall each, ex-officio, be a member of the board of trustees of the American Printing House for the Blind, located in the city of Louisville, Kentucky.

Sec. 4. That the trustees of said American Printing House for the Blind shall annually make to the secretary of the Treasury of the United States a report of the items of their expenditure of the income of said bonds during the year preceding their report, and shall annually furnish him with a voucher from each public institution for the education of the blind, showing that the amount of books and tangible apparatus due has been received.

Sec. 5. That this act shall take effect from and after its passage.

Approved March 3, 1879.

United States Statutes at Large, v. 20, p. 467-69.

UNITED STATES.

Fifty-ninth Congress, Sess. I.

June 25, 1906. (H. R. 16290). Public, No. 288.

Chap. 3536. An Act to modify the requirements of the Act entitled "An Act to promote the education of the blind," approved March third, eighteen hundred and seventy-nine.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that the sum of two hundred and fifty thousand dollars heretofore invested in United States registered four per centum bonds, funded loan of nineteen hundred and seven, inscribed, "Secretary of the Treasury, trustee,—interest, to the Treasurer of the United States for credit of appropriation 'to promote the education of the blind,'" shall upon the maturity and redemption of said bonds on the first day of July, nineteen hundred and seven, in lieu of reinvestment in other government bonds, be set apart and credited on the books of the Treasury Department as a perpetual trust fund; and the sum of ten thousand dollars, being equivalent to four per centum on the principal of said trust fund, be, and the same is hereby appropriated, out of any moneys in the treasury not otherwise appropriated, and such appropriation shall be deemed a permanent annual appropriation and shall be expended in the manner and for the purpose authorized by the Act approved March third, eighteen hundred and seventy-nine, entitled "An Act to promote the education of the blind," approved March third, eighteen hundred and seventy-nine.

Approved June 25, 1906.

U. S. Statutes at Large, v. 34, p 460.

UNITED STATES.

Federal Legislation Concerning the Blind.

Act of February 16, 1657. (11 Stat. 161-162). Incorporation of Columbia Institution for the Instruction of the Deaf and Dumb and the Blind; education of indigent children of the District of Columbia.

Act of May 29, 1858 (11 Stat. 293-294). Additional provision for the Columbia Institution; education of blind children of persons in military and naval service.

Act of February 23, 1865 (1 Stat. 436; R. S. 3689, 4869). Columbia Institution not to give instruction to blind children; those formerly entitled to be educated there to be sent to some blind school in Maryland or elsewhere, at the expense of the United States.

Act of July 13, 1866 (14 Stat. 147, 10). Articles manufactured in institutions for the blind, sold to aid in their support, exempted from internal revenue tax.

Act of March 2, 1867 (14 Stat. 475, 10). Limitation of exemption under act of July 13, 1866.

Act of March 3, 1879 (20 Stat. 467-469). Permanent appropriation of \$250,000 invested in United States bonds, for the education of the blind, through the American Printing House, under supervision of the Secretary of the Treasury.

Act of October 1, 1890 (26 Stat. 604, par. 513). Free entry of books and music in raised print, used exclusively for the blind.

Act of August 27, 1894 (28 Stat. 538, par. 411). Same as act of October 1, 1890.

Act of July 24, 1897 (30 Stat. 196, par. 502). Same as act of October 1, 1890.

Act of March 2, 1899 (30 Stat. 984). Letters written in point print or raised characters used by the blind when unsealed to be classed as third-class mail matter.

Act of February 1, 1900 (1 Stat. 4, 1). Statistics of the blind to be included in Twelfth Census.

Act of June 6, 1900 (31 Stat. 577). Appropriation of \$5,000 for instruction and employment of blind persons residing in the District of Columbia, and for machinery and tools for workshop for the blind.

Act of April 27, 1904 (33 Stat. 313). Books, etc., in raised characters for use of the blind loaned by public institutions to blind readers to be carried in the mails free of postage.

Act of March 3, 1905 (33 Stat. 974, par. 390). Free entry in Philippine Islands of books and music in raised print, used exclusively by the blind.

Act of June 25, 1906 (34 Stat. 460). Amount of \$250,000 invested in bonds under act of March 3, 1879, set apart as perpetual trust fund, and in lieu of the interest on the bonds, a permanent annual appropriation of \$10,000 made for the same purpose.

Act of May 26, 1908 (35 Stat. 295). Repeal of permanent appropriation for instruction of indigent blind children of District of Columbia. (See Act of February 2, 1865); appropriation of \$6,000 for this purpose. A similar appropriation is included in all subsequent District of Columbia appropriation acts, the amount for the year 1917-18 being \$7,500. (Pub. Act No. 379, p. 27).

Act of March 4, 1909 (35 Stat. 1079, 15; 1083, 31). Copyrighted books in raised characters for use of the blind need not be printed in United States.

Act of July 2, 1909 (36 Stat. 4, 8). Statistics of the blind to be included in Thirteenth Census.

Act of August 5, 1909 (36 Stat. 74, par. 518). Same as October 1, 1890.

Act of August 5, 1909 (36 Stat. 169, par. 326). Same as act of March 3, 1905.

Act of June 20, 1910 (36 Stat. 562, 7; 573, 25). Grants of land to New Mexico and Arizona for schools and asylums for the deaf, dumb and blind.

Act of August 24, 1912 (37 Stat. 551). Periodicals in raised characters for the use of the blind to be carried in the mails free of postage.

Act of March 4, 1913 (37 Stat. 748). One copy of every embossed book manufactured by the American Printing House for the Blind to be deposited in Library of Congress.

Act of October 3, 1913 (38 Stat. 155, par. 426). Free entry of books and music in raised print, used exclusively for the blind; also printing apparatus, etc.

Act of September 1, 1916 (39 Stat. 710). Appropriation of \$5,000 for aid and support of National Library for the Blind; also \$1,500 for Columbia Polytechnic Institute for the Blind.

The annual legislative, executive and judicial appropriation acts, beginning with that of April 17, 1900 (31 Stat. 94) contain an appropriation for the reading room for the blind in the Library of Congress.

Pension Laws.

Act of July 4, 1864 (13 Stat. 387, 5). Pension of \$5 a month for loss of both eyes in military service.

Act of June 6, 1866 (14 Stat. 56, 1). Pension of \$25 a month for loss of sight of both eyes in military or naval service.

Act of July 27, 1868 (15 Stat. 237, 12). An act of June 6, 1866, made applicable to persons having lost only one eye and losing it in military or naval service.

Act of March 3, 1873 (17 Stat. 568-569; R. S. 4697, 4698). Pension of \$25 or \$31.25 a month for loss of sight of both eyes in military or naval service or of one eye when that of the other was previously lost.

Act of June 17, 1878 (20 Stat. 144). Pension of \$72 a month for loss of sight of both eyes in military or naval service.

Act of March 3, 1879 (20 Stat. 484). Act of June 17, 1878 made applicable to all cases of blindness from causes occurring in military or naval service.

Act of April 8, 1904 (33 Stat. 163). Pension of \$100 a month for loss of both eyes or total blindness from causes occurring in military or naval service.

W. H. McCLENON, March 13, 1917.

RESUME

As has been seen there is not great similarity as to the methods the different States pursue in looking after their blind population.

For purposes of convenience, an effort will be made to somewhat schedualize them, as has been done with the laws, in the previous papers of this series.

Those States requiring the Compulsory Education of the blind, are California, Connecticut, Delaware, Indiana, Kansas, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New York, North Carolina, North Dakota, Ohio, Oregon, South Dakota, Utah, Vermont, Washington and Wisconsin. All the States provide some form of education for the blind.

Those States having regular schools for the blind are as follows: Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Jersey, New Hampshire, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Alabama, Colorado, Florida, Georgia, Idaho, Arkansas, California, Illinois, Indiana and Iowa.

The following States have industrial homes for the blind, where they are taught trades, industries, etc. These schools usually superintend the selling of the work of the blind. Many of them have stores of their own: Alabama, California, Connecticut, Illinois, Utah, Wisconsin, New Hampshire, New York, Ohio, Maine, Maryland, Massachusetts, Michigan, and Missouri. Some of these States have no institution of the kind in their own State, but pay for instruction in other States.

Some states pay for industrial or other instruction at home. They are Massachusetts, Minnesota, Nebraska, Rhode Island, Utah, Illinois, and Indiana.

The following States pay for school instruction for the young in other States: Massachusetts, New York, North Dakota, Pennsylvania, Rhode Island, Nevada, Wyoming, New Jersey, and New Mexico.

The following States provide readers to read to the blind at their homes: New Jersey, New York, Ohio, Kansas, Minnesota, Missouri, California, and Indiana.

The following States provide a free University instruction for those blind people desiring a higher education: New Jersey, South Carolina, Minnesota and Nebraska.

The following States pay pensions to the blind: Idaho, Illinois, Iowa, Kansas, Maine, Maryland, Missouri, Wisconsin, New Hampshire and New York.

The following States pay for clothing and funerals for the blind:

New Jersey, New York, North Carolina, Rhode Island, South Dakota, Wyoming, Kansas, Louisiana, Michigan, Minnesota, Missouri, Montana, Arkansas, California, Colorado, Connecticut, Florida, Illinois and Indiana.

The following States provide tools for blind workmen: Maryland, Minnesota, Mississippi, Missouri, Nebraska, Utah, Wisconsin, New Hampshire, New Jersey and Connecticut.

There are State Commissioners for the blind or the equivalent in New Jersey, New York, Ohio, Oregon, New Mexico, Tennessee, Utah, Maryland, Massachusetts, Missouri, Delaware and Illinois, (State Board of Charities and Corrections).

In certain States the blind are exempt from certain things, such as in Arkansas the blind war veterans do not have to pay licenses. In Connecticut, the blind are partially exempt from taxes, and are exempt from tramp laws. In Maine, the blind pay no poll tax, and are exempt from tramp laws. In Tennessee, they pay no poll tax. In New Hampshire, Pennsylvania and Rhode Island they are exempt from tramp laws and in New York, they are exempt from certain license taxes.

In concluding this series of papers on State Laws Concerning the Eye, I wish to thank all who have helped me in the compilation. It has been a great task, more than would be imagined, as it is extremely difficult to get accurate information. I hope the material may be of use. Errors have inevitably occurred as, for instance, after having received a printed Optometry Law, from Pennsylvania, which I was informed from a trustworthy source had become a law, I was informed that the proposed law failed to pass. I am also informed by the "Keystone Magazine of Optometry" that the only States not having Optometry laws at the present time are Alabama, Kentucky, Louisiana, Mississippi, Missouri, Ohio, Pennsylvania and Texas. In my compilation I stated that Pennsylvania had a law, and that South Carolina, Wyoming and the District of Columbia had none. Of course, laws are constantly being passed in some States, and it is possible that between the time of writing my papers, and the time of their publication, changes may have occurred. In this way, and in other ways, errors have undoubtedly taken place, but I have done the best I could, and I believe that these compilations are reasonably correct.

I wish especially to thank Dr. H. V. Würdemann for his courtesy in opening the pages of Ophthalmology for this series of articles.

No. 7 West Madison Street.

Abstracts from Recent Ophthalmic Literature

ANOMALIES

FUCHS' COLOBOMA WITH A LOOP OF RETINAL VEIN HIDDEN BEHIND FOLD OF RETINA.—FEINGOLD, M., New Orleans (*Ann. Ophth.*, January, 1917). The case of a man of thirty years with high astigmatism, but with normal vision under correction, is reported with a fundus condition which shows several characteristics of the classic coloboma of Fuchs, in addition also features not ordinarily observed in these cases. The picture presented of this case indicates a staphyloma of sclera with at least partial absence of the chorioid over it, allowing a part of the retina, which otherwise extends continuously over it, to bulge into the staphyloma, dragging the vein lying in it along until it forms a loop in the subretinal pocket near the margin of the optic nerve. This pocket is outlined by rather definite margins and occupies a situation immediately below and slightly to the temporal margins of the disc. These margins curve downward and converge to a point which is the apex of a triangle of shield-like form with the base of the shield at the margin of the disc. It is natural to conclude that this condition formed during fetal development and was not due to stretching. It is remarkable that the hidden vessels in all these cases have been veins. An examination of the field of vision showed an increase in the blind spot in its vertical diameter. Marked astigmatism is often found in these cases and the coloboma is mostly found in the direction of the meridian of strongest refraction which was true in this case. The corneal astigmia as evidenced by the ophthalmometer corresponded with the amount found by the subjective test.

M. B.

CATARACT

ON THE INDIAN OPERATION OF COUCHING FOR CATARACT.—ELLIOT, ROBERT HENRY, London (*Brit. Med. Jour.*, March 10, 1917). This paper is based on statistics obtained from a study of 780 cases of couching which the author has collected in India. In addition, he has obtained fifty-four globes on which the operation had been performed. He refers to this ancient operation as having been practiced by Celsus; with the advent of British surgery in India, couching attracted much notice and the crude and filthy

methods of the coucher excited horror among exponents of modern surgery.

There are two distinct operations performed—namely, the anterior, in which the lens is attacked through the cornea or limbus from in front, and the posterior, in which the incision is placed behind the ciliary body, well back in the sclera. The latter is by far the more scientific procedure, two instruments being used, and a deliberate attempt being made to break down the suspensory ligament of the lens, before its dislocation is attempted. Owing to dirty methods and crude instruments, the results of couching are very bad, only twenty-one per cent of the operations yielding vision of one-tenth or better, sixty per cent of those lost being avoidable. The causes of failure are, in order of frequency, iridocyclitis, glaucoma and imperfect dislocation. The author found the cataractous lens dislocated forward four times in the fifty-four globes examined; dislocation backward was the rule, the lens lying either free in the vitreous, entangled in an exudate, or fixed to the back of the iris and ciliary body, or in front of the anterior hyaloid membrane.

Sometimes the coucher accidentally injures other structures such as the cornea, in which the writer observed opaque scars frequently. Scleral injuries are common as are also injuries to the iris. Wounds of the ciliary body are also frequent. The plastic type of uveal inflammation of varying severity, confined to the iris and ciliary body, was most ordinarily found.

A shallow anterior chamber was often observed, together with iris bombé in several cases. Abnormal contents consisted of pus, blood, a mixture of pus and blood, vitreous, lens matter and structureless albuminous exudate. In the great majority of the eyeballs the vitreous body was infiltrated with inflammatory material which tended to undergo organization and resulted in detachment. Detachment of the retina occurred in over seventy per cent of the globes. A large number of the globes presented numerous dots on the retina, varying greatly in number, size and color (from white to gray or glistening) which were usually of long standing, thus indicating a degenerative process; the dots were caused by localized proliferations of cells along retinal vessels, by collections of mononuclear cells on the surface of the retina external to the limiting membrane and by small cysts developing in the walls of the retina as the result of the coalescence of oedematous spaces therein formed.

Allowing for the fact that numerous globes had undergone late

changes calculated to hide evidence of previous glaucoma, nineteen out of the thirty left had suffered from high tension. C. H. M.

TREATMENT OF CATARACT DURING THE EARLIER STAGES.—THOMPSON, H. M., Pueblo (*Annals Ophth.*, January, 1917). The author objects to the use of the term senile cataract and thinks that cataract should be recognized always as pathological, resulting from local and constitutional causes. He mentions toxemia from alveolar abscess and chronically inflamed pus-laden gums, chronic stasis of the intestinal tract and eye strain. It is necessary to select the cases carefully and to institute treatment only in such as are likely to be amenable to treatment. The opacity must not have reached a state of marked change in the lens fibres, and the vision should not be reduced below 20/40. In proper cases, it is possible to get a view of the fundus, but with a plus lens woolly translucent opacities are seen scattered throughout, often having a predilection for the lower half.

Any abnormal or pathologic change of the system must be treated. In all cases special stress should be placed on the regulation of the diet, increased water intake, and frequent eliminative treatment by calomel and salines. In addition, in those cases in which no special lesion shows, beyond the atheromatous arterial changes, potassium iodid should be administered in small doses over a long period of time. Locally the author advises the use of subconjunctival injections of cyanid of mercury 1-4000, the instillation of eserine (one grain to the ounce) and rest of the eyes. Hyperopia and all astigmatic errors should be carefully corrected, and tinted glasses should be worn when the patient is exposed to bright light.

Of nine cases treated in the last seven years, clearing of the lens opacities and improvement in the vision occurred in all but three of the cases. The author says that it is poor practice to treat cataract cases that are too far advanced on account of the possibility of delaying the ripening process and so preventing the lenses from acquiring the ideal condition for extraction. J. M. W.

HEREDITARY POSTERIOR POLAR CATARACT, WITH REPORT OF A PEDIGREE.—ZIEGLER, S. LEWIS, AND GRISCOM, J. MILTON (*Ann. Ophth.*, October, 1916). In September, 1909, two boys aged ten and fourteen were seen at the Wills Hospital for defective vision. They were both found to have double posterior polar cataract of hereditary type. Inquiry brought out that numerous relatives had defective vision. The original member of this family migrated to

this country from France in 1810, but no record could be found relating to his eyes. The first member of the family who was known to have congenital cataract was a son of this original settler. In the second generation there were six out of nine members who had congenital cataracts. In the third generation ten out of thirty-one were afflicted and in the fourth generation seven out of twenty-three had congenital cataracts. In every case examined and in all the hospital records reviewed, the opacity was situated on the posterior capsule, and varied from a small round dot to a dense circular disc covering the central third of the capsule. No other congenital ocular defects were found and the family as a whole was apparently up to the average of those occupying a similar social position. A study of the pedigree shows that there were sixty-four members in the four generations, of whom twenty-four, or 37%, had congenital cataracts. There were ten out of the twenty-three females, and fourteen out of the forty-one males afflicted. The rule of "once free always free" is followed in this family, and in no case did normal parents produce affected children. Just one-half of the children of cataractous parents inherited the condition. Males were much more prone to transmit the defect, since twenty out of thirty-one children, or 64%, descending from cataractous males, were affected, while only three out of nine children, or 33 and 1-3%, descending from cataractous mothers, had cataracts. The history of the two boys first mentioned is suggestive of low resisting power, both mentally and physically. The eye of one boy was operated upon by discission and discharged cured in five weeks. Three months later the right eye was operated upon in the same way. In a few days there developed a virulent iridocyclitis with exudate resulting in complete loss of vision with shrinking of the globe. In two months he returned with beginning sympathetic ophthalmitis. The exciting eye was enucleated but in six months the sympathizing eye became shrunken and almost sightless. The younger brother was operated upon with good visual result but became unmanageable at home and had finally to be sent to the School for Feeble-Minded Children. The observers of congenital cataract are divided into two schools in their efforts to explain the mechanism by which congenital lenticular deformities are produced: (1) Those who believe the basic cause is toxic, and (2) those who believe that there is an arrest of or an alteration in the development of the lens, due to some inherent abnormality in the germ cell. The authors think there is strong evidence to support both theories,

and that it is probable that neither one singly explains every case, while in some cases both may be active factors. M. B.

EXTRACTION OF CATARACTS IN THE CAPSULE BY A SLIGHT MODIFICATION OF THE VON GRAEFE METHOD.—TOROK, E., New York (*Ann. Ophth.*, October, 1916). The Kalt forceps are used to engage the anterior capsule while a Daviel spoon is used to make intermittent pressure below the lower corneal limbus, at the same time lateral and circular movements are made with the forceps until the zonule is ruptured. The lens is then raised with the forceps and pressure below with the spoon causes the lower edge of lens to turn forward and present in the wound above, when by combined use of spoon and forceps it is delivered. He makes a large section in the limbus with a conjunctival flap and performs an iridectomy. If the capsule ruptures he proceeds as though having done a capsulotomy and goes in with the Kalt forceps afterwards and removes as much of the capsule as possible. He has tried this method in fifty-three cases and in thirty-seven has succeeded in removing the lens intact in its capsule. In immature cataracts he has found it impossible to get a firm grasp of the capsule. He lost vitreous in two cases, but not during the height of the operation, but when removing the speculum after completion of the toilet. M. B.

ON THE AMBULANT AFTER-TREATMENT OF CATARACT EXTRACTION, WITH A NOTE ON POST-OPERATIVE DELIRIUM AND ON STRIPED KERATITIS.—BRUNS, HENRY DICKSON, New Orleans (*Ann. Ophth.*, October, 1916). He has a large clinic in a hospital with limited housing capacity. In 1908 a cataract patient was by mistake allowed to go home immediately after the operation and was not seen for 48 hours. The case did as well as any that had been in the hospital. Because of the crowded hospital facilities more and more cataracts were allowed to go home at once after the operation and the results in these cases have been about on a par with those who remained in the hospital for the after-treatment. He used for years a dressing which exerted some pressure on the eyeball, and as striped keratitis was the rule, he modified the dressing so that no pressure obtained and found that the striped keratitis did not occur.

Post-operative delirium he attributes to the change of scene, the quiet and loneliness of cataract cases confined in the hospitals and finds it does not occur in the ambulant cases. M. B.

PERSONAL EXPERIENCE IN EYE TROUBLES.—CAMPBELL, JAMES A., St. Louis (*Jour. Ophth., Otol. and Laryngol.*, December, 1916). Six cases of cataract tendency with retarded development are reported. They were all cases of diffused lenticular cloudiness, some of them passing from plus to minus errors of refraction during the twenty to thirty-five years they were under observation. In some of them the cataracts matured in one eye but not in the other. Some of them had always been myopic and these cases showed less tendency to progress. He used the Wappler massage on several of these cases with seeming improvement in vision. He makes a plea for conservatism in prognosis. The common prognosis that blindness will follow in a few years is to be deplored. M. B.

CHORIOID

A CLINICAL AND PATHOLOGICAL STUDY OF TWO CASES OF MILIARY TUBERCLES OF THE CHORIOID.—RANDOLPH, ROBERT L., AND SCHMEISSLER, H. C., Baltimore, Md. (*Ophth. Record*, Jan., 1917). The two cases of miliary tubercles of the chorioid reported above are of interest because:

In the one case there is general miliary tuberculosis with acute tuberculous meningitis, and in the other with general miliary tuberculosis without meningitis.

The miliary chorioidal tubercles were demonstrated during life, and verified at autopsy both grossly and microscopically, including the demonstration of the tubercle bacillus in the lesion. G. I. H.

CIRCULATION

CONCERNING SUDDEN OBSTRUCTION TO THE RETINAL CIRCULATION IN A CASE OF CARDIO-RENAL DISEASE.—RING, G. ORAM, Philadelphia, Pa. (*Ophth. Record*, Feb., 1917). Patient male, aged 57 years. The phenomenon, particularly the condition noted at the first visit with the cherry-red spot at the macula, pointed to what is commonly known as embolism of the central artery. A number of possibilities of explanation of this red spot have been made; little hemorrhages, retino-chorioiditis, yellow pigment of the macula, but that most usually now considered is that it is caused by the red of the chorioid shining through the retina at the point where it is thin and the brilliancy is accentuated by a contrast of its surroundings, the cerebral layer of the retina in which the cloudiness is situated being absent at the macula. G. I. H.

THE INFLUENCE OF VASCULAR DISEASE IN THE RETINA ON THE PROGNOSIS AS REGARDS LIFE.—ADAMS, P. H., Oxford (*Brit. Jour. Ophthalm.*, March, 1917). The writer states that the most numerous cases of general medical interest seen by ophthalmic surgeons are those that have some form or other of disease of the vascular system. With the idea of finding out what happens to these patients and when, he undertook an inquiry and endeavored to trace the end of such cases. The types of retinal lesions selected were flame-shaped hemorrhages and signs of vascular disease in the retina, venous thrombosis and hemorrhagic retinitis, "embolism" of the central artery, retinitis curcinata; in fact all those conditions usually associated with arterio-sclerosis. One hundred and fifty-nine cases were collected of whom one hundred and twenty-four were traced; of the total number sixty-three were males, the remainder ninety-six females—fifty-eight of them married and thirty-eight single.

After giving tabulated statistics of one hundred and fifty-six of these cases and discussing the prognostic influence of these lesions, the writer concludes that retinal lesions are considerably more common in women than men, and that not altogether due to child-bearing, as thirty-eight of the ninety-six women were, as far as he could discover, unmarried. The cases were most numerous between the ages of sixty and seventy, and next between fifty and sixty. The older the patient, the better the prognosis as regards life, irrespective of the presence of albumen in the urine to a large extent, whilst the younger the patient, the worse the prognosis, especially so if albumen is present in the urine. C. H. M.

CONJUNCTIVA

PARINAUD'S CONJUNCTIVITIS.—DUTROW, HOWARD V., Dayton, Ohio (*Ophthalm. Record*, April, 1917). Patient a woman aged 28. Right eye affected. The duration in this case was about three months, without suppuration of the glands and without any permanent injury to the eye. Dutrow states that it is a positive mistake to use highly irritant agents such as copper sulphate, silver nitrate, etc., and especially the radical surgical treatment as is very often employed in the treatment of trachoma. The disease is practically self-limited and the best results will be had by the use of general cleansing, non-irritating collyria. G. I. H.

TUBERCLE OF THE CONJUNCTIVA.—PATTERSON, JAMES ALLEN, Colorado Springs (*Annals Ophthalm.*, January, 1917). The patient

was a woman fifty-seven years of age who had pulmonary tuberculosis. Eversion of the right eyelid revealed a large round ulcer three millimetres from the margin of the lid, and a small one of linear shape near the outer canthus. The round ulcer had deep, undermined edges with a gray and somewhat speckled center which was depressed, giving a slightly umbilicated appearance. The linear-shaped ulcer was narrow, with equally steep undermined edges, with a gray-colored center. A small quantity of mucopus was secreted and was removed many times during the day by the patient. There was practically no congestion surrounding the ulcers. No involvement of the lymphatic glands could be found in the facial or cervical regions. Absolute cure of the condition resulted from thorough curetting of the ulcers and cauterization with a saturated solution of trichloroacetic acid. Scars of the original ulcers can be distinctly seen. The author was unable to find tubercle bacilli in the scrapings from the ulcer.

J. M. W.

CORNEA

IN RE CORNEAL ULCERS, A PRACTICAL NOTE.—YOUNG, H. B., Burlington, Iowa (*Ophth. Record*, January, 1917). The author uses a "cavity drier," and heats the tip to a cherry red, squeezes the rubber bulb, and so pumps a fine stream of burning air exactly upon the infected area. As to the type of ulcer it may be found that in those with small openings it will be better to first make a wide crucial incision through the overlying tissue, elevate the flaps and gently scrub the cavity with a small cotton shod toothpick. It may be even better to have the cotton just moistened with 95 per cent carbolic acid.

G. I. H.

TREATMENT OF CORNEAL ULCERS.—DABNERY, S. G., Louisville, Ky. (*Ophth. Record*, January, 1917). The author sums up the treatment as follows:

First: In clean corneal ulcers, atropine, bandage and hot fomentations form the treatment for the average case—the cause of course being removed. In very slight abrasions from a foreign body the removal of this may be sufficient.

Second: In purulent ulcers the same measures should be carried out—the bandage of course being omitted if there is much secretion. Local antiseptics such as iodoform or tincture of iodine, and if these do not arrest the ulcer, the galvano-cautery should be applied.

Third: In threatened marginal perforation and occasionally in miliary phlyctenules eserine may be better than atropine.

Fourth: In phlyctenular keratitis resisting ordinary measures tuberculin is worthy of trial even though the diagnosis of ocular tuberculosis is not perfectly established; and as a thorough examination of the chest and other parts of the body is necessary before using tuberculin, an experienced general physician should work in association with the oculist.

Fifth: The use of sub-conjunctival injections of cyanid of mercury is to be commended in very severe and obstinate purulent ulcers.

Sixth: Ethyl-hydro-cuprein and the Pasteurization treatment are worthy of further trial.

GENERAL DISEASES AND THE EYE

STUDIES OF EYE GROUND CHANGES IN CEREBRAL SPASTIC PARALYSIS.—KEARNEY, J. A., New York (*New York Med. Jour.*, Feb. 3, 1917). This paper is based on extensive studies of the eye grounds in both operative and non-operative cases of cerebral spastic paralysis with changes attributed to abnormal increase in the pressure of the cerebro-spinal fluid.

The writer contrasts the usual appearance of the eye grounds of more advanced spastics and of infants who exhibit spastic signs when these are due to intracranial hemorrhage at birth. He examined the fundi of an infant two weeks old, a difficult instrumental delivery, who had convulsions about every hour, and found a recent transparent papilledema with elevation of 2.00 D. confined to the nasal side of the disc; a decompression operation was performed and a subdural hemorrhagic clot removed; two days later no elevation of the disc was found.

In eighty cases observed during operation, the dura was always found to be tense, whitish, opaque and thicker than normal, the cortex edematous and under increased pressure; in addition to these findings, in seventeen cases cystic formations with adhesions and in ten cases hemorrhagic remains were found. Accouchement in thirty cases was instrumental, in twenty-four difficult, in nineteen normal, in five precipitate, and in one premature. The pressure of the cerebro-spinal fluid was normal in five cases and increased in the remainder. The majority of the children when they applied for relief were between the ages of two and fourteen years. The writer states that by the time the greater number of these afflicted

children reach the neurological surgeon today, the spasticity has existed for some time and the eye grounds show only regressive edematous changes; even at this late day the results obtained by a decompression operation in selected cases are gratifying.

In conclusion he expresses the opinion that every child whose delivery was difficult or instrumental should have its fundi examined directly after birth. If pressure signs are determined in the fundus of the eye and confirmed by the measurement of the cerebro-spinal fluid in lumbar puncture, a decompression operation removing the hemorrhagic clot as soon as possible, would greatly lessen the condition which results from neglect of this procedure.

C. H. M.

GLAUCOMA

IRIDOTASIS IN GLAUCOMA.—STIEREN, EDWARD, Pittsburgh, Pa. (*Ophth. Record*, February, 1917). The eye is cocaineized thoroughly and a conjunctival flap made as in the trephining operation. The flap need not be as large nor is it necessary to carry the dissection to the corneal layers, but the flap should contain all the subconjunctival tissue down to the sclera. A small keratome incision is then made under the conjunctival flap just behind the limbus and just large enough to admit the iris forceps. The pupillary edge of the iris is grasped and gently withdrawn and when released outside of the corneal incision it will be noticed that the under surface of the iris is now up. The conjunctival flap is stroked back into place and the speculum carefully removed, the operation requiring not more than five or six minutes to perform.

There appears to be only one contraindication to the operation and that is where the iris is so atrophic and friable that it cannot be drawn into the wound as it tears into shreds with each group of the iris forceps.

The prompt results following iridotasis are due equally as much to the stretching of the iris, thereby keeping open the filtration angle at this site, as to the subconjunctival drainage. G. I. H.

SOME CAUSATIVE FACTORS IN GLAUCOMA AS OBSERVED IN THE LONDON HOSPITALS DURING THE PRESENT HOSTILITIES.—MAIDEN, S. D., Council Bluffs, Iowa (*Ophth. Record*, April, 1917). The object of this paper is to show in what way glaucoma is effected by the following conditions:

1. Reduced bodily resistance,—brought about by excessive use of alcoholics, lack of nourishing food and proper shelter.

2. The presence of local infections as,—diseased tonsils, sinusitis, C. S. O. M., carious teeth along with constitutional diseases.
3. Constant mental strains and severe frights and exposures.

G. I. H.

HALOS OF GLAUCOMA—A DIFFRACTION PHENOMENON.—FISCHER, VALENTINE B., Boulder (*Annals Ophth.*, January, 1917). The writer gives an account of technical laboratory experimentation dealing with the formation of halos. In the laboratory halos have varying stages of completeness, depending upon the gratings which cause them. The best halos are obtained through a grating containing apertures from one to four half wave lengths for blue light. When it is realized that waves of blue light are in the neighborhood of $1/50,000$ of an inch, some idea is gained of the fineness of the rulings, but not fineness of ruling alone makes an efficient grating. Efficiency is lost if the opaque elements which comprise the gratings occupy different planes, or if the opaque spaces are much larger than the transparent spaces. In the cornea, not all opacities are arranged in a manner that would produce grating effects. In parenchymatous opacities the individual deposits are too scattered as to situation and they do not occupy the same corneal plane. The opacities in glaucoma comply better with the conditions of the grating in that they are situated in a single stratum of the cornea. The only reason that such opacities do not cause halos more generally is that the aggregate opacity is too dense or too thin.

J. M. W.

GLAUCOMA CONGENITALIS AND BUPHTHALMIA WITH A SOFT EYE IN THE SAME PATIENT.—HALLETT, DE WAYNE, AND BEALS, M. B., New York (*Jour. Ophthal., Otol. and Laryngol.*, November, 1916). Boy of seven. Right eye large from birth and always blind. It was not known that left eye was defective until boy started to school. When patient was brought to clinic the right eye was found to be very soft, tension 3 mm. Hg., globe very large, very deep ant. ch., pupil small, fixed and filled with a gray exudate but free from signs of inflammation. The left eye presented all the signs of buphthalmia, but was smaller than its fellow. It was nystagmic and the optic disc was deeply cupped. Tension 58 mm. Hg. Neither eye had any irregular corneal or scleral ectasia. Diameter of right cornea 18 mm., left 14 mm. Treatment was confined to left eye. The effect of myotics reduced the tension to 50 mm. Hg. A sclerocorneal trephine operation with a wide iridectomy was done, using a $1\frac{1}{2}$ mm. trephine. Tension, at first low, rose to 36 mm. Six

weeks later a similar operation was performed. Tension gradually rose to 30. Six weeks later a third trephine operation was performed with a 2 mm. trephine. This time the tension remained low, it being 16 mm. after three months with ability to count fingers at 20 feet. M. B.

A CASE OF GLAUCOMA FOLLOWING USE OF ATROPINE WITH UNUSUAL COMPLICATIONS.—SUTPHEN, T. Y., Newark, N. J. (*Ann. Ophthalm.*, October, 1916). A vigorous, healthy woman of 38 was given a one-half of one per cent solution of atropine for cycloplegia and returned two days later with no unfavorable symptoms for refraction and was found to have normal vision with a $+1.25$ S. over right eye and with $+.50=+.25$ ax. 150° over left eye. She was not seen again for a week when her vision was found to be reduced to 20/40 in each eye, right cornea steamy, tension 30, pupils widely dilated with circumcorneal injection. Treatment, warm compresses, and 2% sol. pilocarpine. In two days' time all symptoms of glaucoma had disappeared and two days later she was all right with normal vision. A week later she returned to the clinic when she was seen by an assistant, a man of experience, who felt sure there was a mild iritis, the pupils being contracted with slight synechia in the left. Atropine was prescribed. She returned in six days' time with a violent glaucoma of each eye, which eserine and injection of sodium citrate failed to control. An iridectomy was performed upon each eye. The pillars in right eye were adherent in the wound and in this eye the tension remained a little high, so much so that another corneal section had to be made with a linear knife to sever the adhesions. The tension then came down and remained down, but with high astigmatism and vision not better than 20/100. The left eye for a time did nicely. A week later the cornea became milky, but cleared up under hot compresses. About a month later there suddenly developed a rupture of sclero-corneal junction at lower nasal quadrant with an uveal protrusion. The hernia increased in size when it had to be incised twice before it flattened out and remained so. Vision finally under a rather high astigmatic correction came up to 20/15 and remained so. M. B.

ON TRAUMATISM AS ETIOLOGICAL FACTOR IN PRIMARY GLAUCOMA.—GOLDZIEHER, W., Budapest (*Wiener Klin. Woch.*, 1916, No. 13, *Abstract in Centralblatt f. prakt.*, Aug. 40, p. 192). The previously healthy eye of a soldier became blind from glaucoma after he had sustained a severe contusion by explosion of a pro-

jectile. The eye showed no external or internal injuries or inflammatory changes that might have led to secondary glaucoma, excepting a slight opacity in the lower half of the lens without rupture of the capsule, which was considered as contusion cataract without swelling of the lens substance. A chemical alteration of the aqueous could not be thought of. Hence the case presented the development of a typical glaucoma after a severe contusion of the eye, which must be termed chronic glaucoma. Which intermediate elements led to the affection could not be ascertained, on account of the so far unknown etiology of primary glaucoma.

In a second case G. saw a primary glaucoma as a direct consequence of a trauma. The case differed from the former by the presence of an anterior synechia, produced by a punctiform rupture of the cornea.

C. Z.

INJURIES

EXPLOSION OF THE SNELLEN EYE IN THE ORBIT—REPORT OF A CASE.—WEIDLER, WALTER BAER, New York City (*Ophth. Record*, Jan., 1917). The only disadvantage in the Snellen "Reform" eye seems to be this tendency to explode. This is due to the thinning of shell at a point on the posterior surface of the eye where it is fused. Going from the extreme cold of out-of-doors into a very hot room accounts for the explosion in this case.

G. I. T.

INJURY OF THE SYMPATHETIC IN ENUCLEATION.—DIMITRY, T. J., New Orleans, La. (*Ophth. Record*, April, 1917). The author states that the sympathetic is injured and produces certain disfigurements in a predominant number of cases, and to correct this fault we must demand greater skill and care, or require an improved technique in enucleation of the eye.

G. I. H.

CONTUSION OF THE EYE, WITH RUPTURE EXTENDING ACROSS THE OPTIC DISC.—SHUMWAY, EDWARD A., Philadelphia, Pa. (*Ophth. Record*, April, 1917). Patient a boy aged 8 years. Left eye struck by a stone at a distance of about fifteen or twenty feet. As to the mechanism of the tear, the author thinks that the sudden severe blow by the stone caused a violent rotation of the eyeball upward and a separation of the nerve from its scleral attachment.

G. I. H.

THE REMOVAL OF FOREIGN BODIES BY MEANS OF A GIANT MAGNET.—POOLEY, G. S., Sheffield (*Brit. Journ. Ophth.*, Jan., 1917). The author's experience is that foreign bodies are more frequently

irregularly triangular flakes with sharp angles than spindle-shaped and smooth, as Haab assumes.

When the foreign bodies are situated in or behind the lens, his rules are: 1. No attempt at removal before careful localization. 2. Avoid a trial pull which unnecessarily disturbs and clouds the vitreous, and causes pain which makes the patient less easy to control. 3. Do not pull on the ciliary body, which is particularly intolerant of any bruising. If a foreign body has to be pulled through the suspensory ligament of the lens, the ciliary body is pulled on and the capsule of the lens is further damaged; the capsule may be scratched, the iris bruised; the inflammatory exudate, which surrounds the foreign body, with any contained micro-organisms is wiped off on the injured lens and bruised ciliary body; the result being increased irritability of the eye and predisposition to attacks of cyclitis, risk of clouding the lens, and lowering the resistance of already damaged tissues. 4. The foreign body should be removed from the nearest point. 5. Avoid removing a foreign body imbedded in the choroid.

The writer's practice is to first remove the lens if badly wounded providing the foreign body is situated immediately behind it. If the lens is not wounded or only slightly so, and the foreign body is situated immediately behind it, the following technique is employed: An antero-posterior conjunctival incision is made about 3 mm. to one side of the intended scleral incision, and a temporary suture passed round the insertion of the nearest rectus muscle, for fixation. A parallel scleral incision 4 or 5 mm. long is made with a Graefe knife and the point of a giant magnet placed upon or just introduced into this. A very small transverse incision may be added if the foreign body cannot be coaxed through the linear incision. The conjunctiva is carefully sutured.

The advantages of the scleral route claimed are: That the operation is easier to perform, as the magnet is nearer and there is no resistance to the passage of the foreign body; that the ciliary segment is not bruised; and there is less likelihood of late infection from a sutured conjunctival wound than from a corneal wound.

In conclusion the claim is made that a larger percentage of eyes is thus saved, better visual acuity is obtained, and a shorter period of convalescence results.

C. H. M.

THE DIAGNOSIS OF A FOREIGN BODY IN THE EYE.—(COLEMAN, W. F., Chicago (*Jour. Ophthal., Otol. and Laryngol.*, Jan., 1917)). After an external examination the ophthalmoscope should be used, then the field of vision taken and then apply the tip of the magnet

to various parts of the eye to see if pain is elicited. The question of a skiagraph depends upon whether it is the intention to draw the foreign body from the depths of the eye into the anterior chamber, if so the skiagraph is not important. If, however, it is the intention to make a scleral opening and apply the magnet through this opening, then it is important to have the foreign body accurately located in order to attack it from the nearest point. The question of a double perforation is very important and can only be determined by skiagraphy. The author favors the scleral route for removal of foreign bodies from the vitreous. For the determination of the magnetizable properties of the foreign body, the magnet and approaching the eye to a long magnetized needle suspended by a thread are methods he advises. M. B.

REPORT OF SIX CASES OF EYE INJURY WHICH REQUIRED ENUCLEATION.—THOMPSON, LEROY, Chicago (*Jour. Ophth., Otol. and Laryngol.*, March, 1917). Six cases of penetrating wounds of the globe by particles of steel which were embedded in the tissues near the posterior pole thus rendering the use of the magnet negative are reported. The cases were all very much alike in that radiography showed plainly the presence of a foreign body in the back of the eye. The magnet tip was introduced through a scleral incision but would not hold the foreign body with sufficient power to remove it, except in his last case. In this case the first use of the magnet failed, but afterward he found he could see two foreign bodies with the electric ophthalmoscope lying in the retina, so he opened into the sclera again and directed the guidance of the magnet tip to the foreign body with the use of the electric ophthalmoscope. Both these foreign bodies were seen to jump to the magnet and were removed. The view was obscured by blood, later, however, a radiograph showed the presence of a foreign body in the same situation and when the eye was removed it was found. All six eyes had to be enucleated because of local or sympathetic disturbance. M. B.

ON LESIONS OF THE CORNEA IN THE AUSTRO-ITALIAN WAR IN THE MOUNTAINS.—VON HERRENSCHWAND, F. (From the eye clinic of Prof. J. Meller in the University of Innsbruck, *Centralblatt f. prakt. Aug.*, 40, p. 161), describes in detail 7 cases of grave lesions of the cornea in soldiers, who had for a long time been uninterruptedly exposed to glaring sunlight in an altitude of about 2,000 m. At first they complained of burning and tearing of the eyes, then of intense pain incapacitating them for service. While

ophthalmia nivalis in most cases is limited to inflammation of the lids and conjunctiva with intense blepharospasm, photophobia and pain, in H's cases a severe lesion of the cornea was most conspicuous. In all, the diseased area occupied the center and was elongated round in only two cases. It consisted in a sharply defined indentation of a horizontal narrow ribbon shaped area spreading toward the temporal side in form of a disc. This shape corresponded to the slightly opened palpebral fissure on account of the glaring. The epithelium showed slight opacities, desquamation, at some places formation of blisters. In the severe cases also the deeper layers of the cornea were affected, presenting intense opacities. Mostly these were composed of minute white dots. In two cases a secondary infection of the diseased cornea from the unclean conjunctival sac occurred with subsequent ulcers.

Ophthalmia nivalis is generally ascribed to the injurious effect of intense violet rays, but occurs also in mountain climbing under a cloudy sky without exposure to direct sunlight. Two of the soldiers constantly wore yellowish green coquilles and still became affected. v. H. therefore thinks that the inflammation is caused not alone by the ultraviolet rays and thinks of the possibility of the direct effect of the cold to which the eyes of the soldiers were exposed during the fight and while standing guard, which requires the greatest attention. The certainly diminished blinking of the lids during strained observation does not protect the surface of the eyeball from being cooled. The exsiccating quality of the rarefied air in higher altitude and an increased evaporation of the lacrimal fluid in consequence of the cold winds are further deleterious elements. The observed formation of blisters in the diseased parts of the cornea do not speak against this assumption as blisters of the skin may occur in freezing of the second degree (bullous congelation). That the changes of the cornea were so severe in these cases may have been due to the long and severe exposure.

Treatment with yellow ointment with an admixture of 10% Perubalsam was very effectual. The violet subjective symptoms soon disappeared, and the course of healing was very favorably influenced by it. C. Z.

INSTRUMENTS AND METHODS OF EXAMINATION

A NEW CATARACT KNIFE AND A KNIFE FOR DACRYORHINOSTOMY.
—BLACK, MELVILLE, Denver, Colo. (*Ophth. Record*, Feb., 1917).
The cataract knife to be used for cataract operation where the eyes

of the patients were so small and deeply seated that the greatest difficulty was experienced in making the corneal sections with a linear knife. The dacryorhinostomy knives are intended to be used to cut away the thin bony wall between the lacrimal sac and the nose and thus make it possible to cut this opening from the ocular side rather than from the nasal side.

G. I. H.

A PRECISION TRIAL CASE AND TEST FRAME—THE LATEST OPHTHALMIC PRODUCT OF THE BAUSCH & LOMB OPTICAL COMPANY.—PRENTICE, CHARLES F., New York, N. Y. (*Ophth. Record*, April, 1917). The Portable Phorometer is designed to independently place the optical center or centers of one or more very thin plano-convex and plano-concave trial lenses of small aperture in perfect alignment with the visual axis of each eye. It essentially consists of a white metal front containing a pair of laterally adjustable lens-cells, adapted to hold even four superposed lenses, combined with a vertically adjustable nose-piece and a pair of slightly curved flexible steel temples, whose tension may be so regulated by thumb-screws as to comfortably cling to the patient's head, through lateral pressure at the back of the head above and behind the ears. Each temple, near the point of its attachment to the front, has a joint which is capable of being tightly clamped by a thumb-screw, in order to provide for the proper inclination of the lenses for reading at finite distances. Just in front of each temple-joint is mounted a milled head and graduated scale through which a transverse sighting device may be adjusted to measure the interpolar distance between the lens and the cornea of each eye. This is a very important provision, especially when menisci, contra-menisci, or Punktal lenses, designated in vertex-refraction, are intended to be used as the substituted lenticular corrections.

G. I. H.

RADIOGRAPHY OF THE EYE AND ORBIT.—DIXON, GEORGE SLOAN, New York (*N. Y. State Jour. Med.*, Feb., 1917). The subject is divided into examination for foreign bodies in the eye and orbit, tumors of the orbit, and fractures. The frequency with which foreign bodies are found by X-ray where nearly every other diagnostic point is against such a finding is pointed out. All metals except small pieces of aluminum can easily be shown and also pieces of stone and glass; but small or even moderately large pieces of wood cannot be detected by means of the X-ray unless they should happen to be painted or heavily varnished. The writer considers that it makes little difference what particular method is

used for the localization of foreign bodies in the eye if the operator is thoroughly familiar with it and recognizes the importance of paying the strictest attention to the smallest details. All the methods of real value are based on the same principle, i. e., triangulation as first employed for this purpose by Sweet in this country and by Mackenzie-Davidson in England. He describes briefly the method of plotting and gives the histories of a number of odd or unusual accident cases.

The writer gives many valuable suggestions in connection with this subject including the following points: A single plate should never be wholly relied upon since occasionally the first one may not show the foreign body and again a defect in the plate may be mistaken for a foreign body. A prolapsed iris does not always mean that the foreign body has been large nor does it exclude the presence of a foreign body. Though it is important for the radiographer to obtain a good history of the accident from the patient in order to obtain some idea of the nature of the foreign body, the statement of the patient is often of little value except as to the manner in which the accident occurred. Lead and iron will always yield strong shadows no matter how small, but glass throws a weak one and consequently the tube used for glass should be much lower than one used for iron; glass does not usually travel very far into the globe and generally presents its edge to the source of the ray thus making localization easier than if the opposite were the rule.

Failure to find a wound of entrance is no proof that the globe does not harbor a foreign body. Siderosis is pretty good evidence that a particle of iron is the cause, and strange as it may appear this is occasionally overlooked. Cataract in a young person is generally due to an injury of some sort and frequently a foreign body is found though the patient may strenuously disclaim the occurrence of an accident of any kind. If a skiagraph is not made in a given case, a second foreign body may be left in the eye. Failure to secure the foreign body does not mean that it is not present; the shadow may be of iron rust only; the foreign body may be lost either outside or inside the orbit, or it may be non-magnetic or so slightly magnetic that the surrounding medium forms more resistance to its extraction than the magnet has power to overcome. The attention of the general radiographer is called to the fact that he does not always recognize the necessity of fixing the vision during exposure, and for this reason he sometimes misses a small foreign body completely.

It has not been possible to show intraocular tumors by means of

the X-ray but orbital tumors can be shown and a very fine idea of their size and location can be obtained provided they are not too diffuse. The position of the head and direction of the ray must be such as to throw out the opposite orbit and as many of the ethmoidal cells as possible when exposing for the lateral view. The position for the antero-posterior view is the same as for the frontal sinus. If a neighboring sinus is occluded and invasion of the orbit incomplete we can be pretty sure that it is primary in the sinus; if the reverse obtains, then it is fair to assume that it is primary in the orbit, provided there is no evidence of empyaema in either case.

Fractures about the orbit unless they be in the outer margins are most difficult—further back it is next to impossible to show the line unless the fracture be so extensive that its presence would be self-evident and a skiagraph unnecessary. C. H. M.

THE RING MAGNET.—BUTLER, T. HARRISON, Birmingham (*Brit. Jour. Ophth.*, Jan., 1917). The writer prefaces his paper by stating that until Mellinger invented the ring magnet, the giant magnets in use were all modifications of the Haab pattern. The value of the latter is diminished because, although having great polar magnetic power, this is concentrated at the immediate pole and rapidly diminishes as the distance increases. This explains also why a hand magnet is unable to extract particles of steel until brought into almost immediate contact. In the ring magnet the lines of force lie parallel and do not diverge as in the ordinary magnet; in consequence, the tractive force is great along the central axis at right angles to the plane of the ring, but outside this axis falls off rapidly. The old model consisted of an oval ring, just large enough to admit the patient's head, and was mounted, like the Haab, upon a standard, the patient being obliged to sit with his head in the ring; the new model is balanced so it can be applied in any position of the patient. The advantages of the new model of the ring magnet as compared with the Haab are summed up as follows: (1) The operation can be performed upon a patient lying upon the table. (2) There is no necessity to move him when the splinter has appeared in the anterior chamber. (3) There is no necessity to use a hand magnet. As soon as the splinter is seen in the interior chamber, the circuit is broken, the anterior chamber opened and the spicule removed with the spatula. (4) The power of the ring magnet at its center is great, and is under absolute control. (5) It is much easier to operate with the rods upon a motion-

less patient than to have to move his head this way and that before the Haab. (6) A patient sitting before the Haab may experience pain and move at the critical moment; he may even faint from the pain.

C. H. M.

THE TECHNIQUE OF THE HAAB AND SMALL MAGNETS IN THE EXTRACTION OF INTRA-OCULAR FOREIGN BODIES.—WHITING, MAURICE H., and GOULDEN, CHARLES, R. A. M. C., England (*Brit. Jour. Opth.*, Jan., 1917). The writers have had unusual opportunities of studying cases of this sort; some idea of the number of such cases may be gathered from the fact that in July, 1916, alone, there were thirty cases in which magnetic foreign bodies were removed from within the globe. With such abundant material, they have worked out a systematic plan of treatment and have elaborated many small points of technique to overcome varied difficulties encountered, since no detailed description of the use of the Haab and small magnets in combination has been published. The methods used are, in the main, an elaboration of those used at Moorfields.

In regard to the general principles of method adopted, they say: "The wound of entry made by the foreign body, be it corneal or scleral, is disregarded from the point of view of extraction, unless there be a large unhealed wound in the cornea or sclera. Such a wound indicates the presence of a large foreign body in the vitreous, which it would be hazardous to remove by any other path. In any case these eyes are so severely damaged that there is but little chance of saving them. The method we adopt is to draw the foreign body through the suspensory ligament of the lens into the posterior chamber, and then through a suitable corneal incision, by means of the small magnet. The alternative to this general method is to remove the foreign body, after localization by X-rays, through the original scleral wound, or an enlargement of it, or through a suitably placed puncture in the sclera. In France, where a considerable number of the foreign bodies are non-magnetic, this would entail in many cases an unnecessary opening in the eye."

In a paper published by one of the writers it was shown that the after-results in civil cases treated by this method, were not so good as those in which the foreign body was removed via the pupil and anterior chamber. The assistance given by an X-ray localization is by no means essential to successful treatment; if the localization is likely to involve more than two or three hours' delay, it should be omitted.

The apparatus employed consists of the most recent type, however, actuated by pedal, but without rheostat; the chin rest was

removed, since it hampered the movement of the patient's head. Only the medium sharp-pointed short terminal was used, since this gave a maximum of power with a minimum obstruction to view. Variation of power, when required, was obtained by advancing or withdrawing the eye from the point of the magnet. The small magnet was supplied by Weiss, weighing about half a pound, worked from a 4 cell accumulator, with a terminal of soft iron, one inch long, oval in section and tapered like a screwdriver.

Full directions concerning the technique of the Haab magnet are given, including position of the patient—sitting up and lying down, position of surgeon and of the latter's hands and head, position of the operating lamp, and manipulation of the patient's head. In discussing the operation upon patient lying down, the authors emphasize that at the moment the full strength of the current is employed, the magnet point should actually touch the cornea slightly above its center, as much power is lost if there is even a few millimetres space between cornea and magnet point. The full current is suddenly applied to disengage the foreign body from its bed (if it lies on the retina) and make it pass forward through the vitreous to the posterior surface of the lens as nearly as possible in the horizontal plane. The ideal result is when the foreign body advances through the vitreous to the posterior surface of the lens and slipping around the edge of the lens, appears free in the anterior chamber. The dangers incurred if the force be gradually applied are that the foreign body may be dragged along the retina, forced into the ciliary body, or become entangled in the root of the iris. They impress the importance of noticing the exact moment and position bulging of the iris occurs when pressed upon by the foreign body; the moment, because the current must be cut off at once to avoid entangling the iris, and the position, as this determines the subsequent maneuvers.

Some of the difficulties discussed are: (1) Delay in the passage of the foreign body through the vitreous, most common when the foreign body has been in the eye two or more days and is fixed by exudate; if the dragging sensation which the patient almost always experiences from the time the magnet is first applied if a magnetic foreign body is present, is once produced, efforts to bring the foreign body forward must be continued for some time and it is in these cases that the application of the force of the magnet in a series of jerks proves most useful; in obstinate cases they sometimes apply the magnet to various points on the sclera, thus exerting greater force by placing the point closer to the foreign body, and, by pulling

in various directions, loosening it. (2) Entanglement of the foreign body in the iris, shown by movement of the affected part of the iris towards the magnet-point; such cases require great care in manipulation to disentangle and bring the foreign body into the anterior chamber; it is improper to try to pull it through the iris, since this will only impact it in the tissue. Advice is given as to how to maneuver in these cases with appropriate change in the relative positions of eye and magnet. (3) The presence of a small corneal or corneo-scleral wound with prolapse of iris, when no attempt should be made at removal through such a wound, or through any enlargement, but should be brought to rest as near the lower angle of the anterior chamber as possible. (4) The presence of a very large corneal wound, indicating usually a large intraocular foreign body and a poor chance of saving the eye; here the Haab magnet must be used cautiously with the eye at some distance and at the first sign of the foreign body presenting behind the cornea the small magnet should be used and the foreign body extracted through the corneal wound. (5) The presence of an unhealed scleral wound; if the wound be large, the foreign body should be removed through it; if small, by way of the anterior chamber as if no scleral wound existed.

The writers then describe minutely the technique of the use of the small magnet in the removal of the foreign body from the anterior chamber. They believe a general anaesthetic should be employed in this step as a rule, since the eyes are usually red and tender. Various complications are mentioned, due both to the nature of the wound and to infection of the eye. When a prolapse of the iris exists the advice is given never to perform an iridectomy first, but only after the foreign body has been removed. If a traumatic cataract is present and the foreign body can be seen in the lens and no signs of infection exist, the extraction should be deferred until the cataract is also ready for removal; if, however, the lens is broken up, the foreign body should be removed by the usual method and then the soft lens matter washed out.

In speaking of the complications due to infection of the eye, the writers mention the difficulties in removing a foreign body when vitreous bands prevent it from coming forward freely and advise the placing of the point into the anterior chamber as near as possible to the spot where the foreign body presented, after which by gentle traction and lateral movements the foreign body may be freed. Exudate in the anterior chamber should be removed with iris forceps in case it does not come out with the foreign body.

Hypopyon, if present, should be removed by free irrigation of anterior chamber with normal saline solution. C. H. M.

A HAND MAGNET OF THE INNER POLE TYPE.—GRADLE, HARRY S., Chicago (*Ann. Ophth.*, Oct., 1916). The principle of this magnet is that of Mellinger which he brought out in 1904. His was of the giant type, while the author's is a very small affair, in which the solenoid is laid over the patient's eye with its aperture corresponding to the palpebral aperture. The lids can be retracted directly through the opening by means of nonmagnetic lid retractors. As the foreign body thus comes within the magnetic field of the solenoid, any steel or iron will attract it as soon as the magnetic force is greater than the resistance. The poles made for this purpose are in the form of iron pencils, five in number, one of which is large enough to convert the magnet into the permanent pole type. The other four are 25 centimeters long with diameters of 5, 7, 10, 13 millimeters wide. The magnet is connected to a 110-volt direct current circuit, without any change in voltage or amperage.

The advantages claimed for this magnet are: (1) The price is low. (2) The foreign body is removed by manipulation of the magnet, not by manipulation of the patient's head. (3) The working part of the magnet is light. (4) The power is greater than any of the present hand magnets. (5) The operator's view is at all times unobstructed. M. B.

AN EFFICIENT EYE BANDAGE.—IBERSHOFF, A. C., Cleveland (*Jour. Ophth., Otol. and Laryngol.*, Dec., 1916). This dressing consists of one yard of three-inch gauze bandage split from each end to within one inch of center. This leaves an uncut section two by three inches in the middle of the bandage. A single knot is tied in the strands just at their attachment to the center of the pad. The maneuver converts the pad into a shallow pocket, which may be filled with cut gauze or cotton to the desired thickness. To apply the bandage carry the two strands on the same side as the eye to be dressed around the head to the occiput, and tie with the lower strand of the opposite side. Then carry the upper strand backward along the sagittal suture and tie with the others in a common knot.

M. B.

STEVENS' TROPOMETER. ITS VALUE.—SHAW, J. HOLBROOK, Plymouth, Mass. (*Jour. Ophth., Otol. and Laryngol.*, Dec., 1916). He publishes a table of tropometer readings of 20 cases, a large number of which were cases of convergent squint showing excessive

upward and inward rotation. The author confesses to a skepticism as to the usefulness of the tropometer, which has been greatly modified by this brief study. He feels that at present it can not be trusted too far and yet it may perhaps be a witness whose testimony we can not afford to ignore when taken in connection with other evidence.

M. B.

HAITZ BINOCULAR LOCATION OF SCOTOMA BY MEANS OF THE STEREOSCOPE.—WELLS, DAVID W., Boston (*Jour. Ophth., Otol. and Laryngol.*, Jan., 1917), regards this stereoscopic method of Haitz as the most valuable method for the measurement of central and paracentral scotoma. He obtained from Berlin the Haitz Charts with the accompanying instructions and the latter he has had carefully translated and publishes the exact translation. The method is only adapted to the field of vision in the first 10° zone, but in case of emergency can be extended to 20° . The examination of the 10° zone is undertaken with the Kampimeter charts Nos. 2 and 1. Each portfolio contains a set of scotometer charts and the smaller central blind spots are more quickly discovered with these than the Kampimeter charts. They have advantage over all other scotometers in that by reason of their binocular nature they force the defective eyes, with peculiar constraint to maintain the central position. The scotometer charts will have a special advantage for examination of the central color defects in retrobulbar neuritis. The usual American stereoscope is used which is fitted with lenses of $5\frac{1}{4}$ diopters with their optical centers placed about $8\frac{1}{2}$ cm. apart. It is necessary to first make a test of the central acuity of vision. Ametropic persons should wear their glass. Patients with manifest strabismus are excluded from this test. The test should be broken by rest pauses. The examination takes place as usual by means of a movable object. The division of the degrees is such that distance between them amounts exactly to a visual angle of 1° when the charts are in a normal position, and this side of the chart is always to be placed before the eye to be tested. Chart No. 1 is for crude tests and Chart No. 2 for the finer details. The marker is carried just parallel to the lines both horizontal and vertical from the outside toward the zero meridian. The holder is as fine as a knitting needle and carries an object of $1\frac{1}{2}$ and 2 mm. in size. The first is for use in the zone between zero and 5° and the latter between 5° and 10° . He advises against recording the results upon the usual perimeter charts because their unit is too small for these examinations. It is best to record the result by the help of a rubber stamp upon the back of the chart.

M. B.

TESTS FOR VISUAL ACUITY.—JACKSON, EDWARD, Denver (*Ann. Ophth.*, Jan., 1917). For the subjective testing of refraction, the International Broken Ring Test is inferior to the test letters. But for testing acuteness of vision, it is distinctly better. When, however, the broken ring is arranged like test letters in successive lines of varying sizes, it has no advantage over the test letters, and some disadvantages. It is when a single size of broken ring is arranged in a symmetrical card that its advantages of greater accuracy and convenience appear. So arranged it is to be used by varying the distance of the test from the person to be tested. A set of such cards is presented, of four sizes. On one the broken ring is 72.5 millimeters in diameter. To see the break in the ring at five meters indicates vision of 0.1. The other card has rings of 36.2 and the other two cards indicate vision of 1. at 5 meters and vision of 2. at 5 meters. A table is presented giving the indications of these four tests at various distances.

To use this test the card is held close to the patient, the break in the ring pointed out, and he is asked to indicate its direction. When he understands fully what is expected, the card is taken to a distance, the break in the ring turned in some other direction and the patient asked to indicate its new position. If unable to see the ring at that distance, it is brought nearer until the direction of the break is recognized.

M. B.

CAMPIMETER VERSUS ARC PERIMETER.—PETER, LUTHER C., Philadelphia, Pa. (*Ophth. Record*, Feb., 1917). The writer solved the problem for himself by devising his "hand campimeter," which is now being generally exploited throughout the country. This instrument is small, light in construction, easily held in one hand by the patient, and admits of rapid and easy study before a window after the technique is once mastered. On it complete studies may be made of the entire field with the exception of the moose peripheral temporal and inferior form field in a normal case. It does not lend itself readily to a study of tubular fields. With these two exceptions it covers the whole range of perimetric investigations rapidly and with accurate results. Peter concludes with the statement that the campimeter, even in its as-yet incomplete form, possesses so many advantages over the arc perimeter that the latter instrument may very appropriately be regarded as an office ornament rather than an instrument of much practical value in perimetric work.

G. I. H.

MATERIA MEDICA AND THEREPEUTICS

IONIZATION TREATMENT OF CANCER OF THE EYELIDS.—MASSEY, G. BRETTON, Philadelphia (*N. Y. Med. Jour.*, Apr. 21, 1917). The writer has found zinc ionization by the unipolar method to be particularly well adapted to destroy small epitheliomas situated at the edge of the eyelids or on their external or internal surfaces because of the small current strength needed, making it possible to depend on the electrochemical union of the zinc ions with protoplasm as the destructive force alone, without the development of effective heat for this purpose. One or more very fine zinc needles are inserted in the middle of the growth, from which the zinc ions are radiated in all directions under the cataphoric action of the direct current, with a negative pad elsewhere on the body surface. By inserting the needles in the diseased tissue alone and observing the progress of the whitening effect, the ionization may be confined to the growth and its actual edges of normal tissue, thus conserving a maximum portion of the unaffected eyelid. The low voltage of the direct current is an important advantage in the delicacy of this application in this situation. Complete destruction of the morbid tissue should be aimed at in one application of from fifteen to thirty minutes' duration, with a current proportioned to the size of the growth. Local anaesthesia is usually sufficient.

With more extensive growths about the orbit, bipolar ionization is quicker and more effective; the positive zinc needles are inserted just beyond the edges of the growth and the negative in the center; the current may be increased to 500 or more milliamperes without having any material part traverse the eye structures, since the bulk flows between the two poles. With the larger currents great heat is evolved in the midst of the growth itself, usually a boiling or near boiling temperature, which materially assists in the quick destruction of the growth. General anaesthesia may be necessary.

The needles are cut from one sixty-fourth inch sheet zinc and attached to No. 34 cotton covered copper wire, and after insertion are kept in place by adhesive plaster attached to the wire. The eyelid should be retracted by the finger or with a hard rubber retractor.

The writer gives the histories of twelve cases of operable growths of the lids, some small, some extensive, all of which have remained free from disease for considerable periods. A summary account is also given of six inoperable cases, in none of which the disease was eradicated; three of these were inoperable sarcomas of the orbital cavity and three similar carcinomas, all were recurrent after enucle-

ation of the eyeball or the exenteration of the orbit; in one of these cases death resulted; in the others merely palliation. He thinks better results might now be possible under more recent bipolar technic, provided, of course, that the disease has not passed beyond the orbital foramen.

C. H. M.

THE USE OF ETHYLHYDROCUPREIN IN DISEASES OF THE EYE.—ZENTMAYER, WILLIAM, Philadelphia (*N. Y. Med. Jour.*, Feb. 24, 1917). After a review of the literature of the subject, the author gives results obtained in three cases of pneumococcal conjunctivitis treated with optochin; in the first case, the inflammation was of less than twenty-four hours' duration and one instillation of the drug resulted in a cure; in the second, the organisms disappeared on the fourth day and on the sixth a cataract was extracted with perfect healing; in the third case, the process had lasted two weeks, with improvement at first and then a relapse, and five months later the eye was still inflamed and other organisms were present in the secretion. He emphasizes that the drug should be used with extreme caution in view of the fact that Oliver asserts that cases have been reported in which the instillation of a one per cent solution produced rapid destruction of the cornea; that other methods be used in conjunction; and that the toxicity of the drug should be remembered when injecting the solution into lacrymal passages.

The writer gives brief histories of eight patients in whom the remedy had been used for pneumococcal ulcer of the cornea. In regard to the method of using, he points out that the drug is supplied in its basic form and as a hydrochloride. The latter is soluble in distilled water up to five per cent strength. Clinically, the hydrochloride has usually been employed, in one and two per cent strengths. The method which appears to give the best results in the treatment of corneal ulcers is that proposed by Kummell. A two per cent solution is daily applied to the ulcer by means of a small cotton pledget and a one per cent solution is instilled hourly into the conjunctival sac. Schwartzkopff used to advantage a salve of optochin hydrochloride 0.1, atropin 0.1, amyl 2, vaselin 10, applied every two hours. For the relief of blepharospasm and photophobia a five per cent solution is instilled, and repeated, if necessary, every two days. As the drug is, in all strengths, painful, it would seem advisable to precede the use of the stronger solutions with an anesthetic.

In conclusion Zentmayer remarks that ethylhydrocuprein is a valuable aid in the treatment of pneumococcal infections of the eye

and that it often acts as a specific in pneumococcal ulcers of the cornea, especially if the treatment is begun before active tissue destruction has occurred and that the course is shorter and much more favorable than was the case of those treated by the methods used in earlier days. The evidence at hand as to its value in diseases of the cornea and conjunctiva due to other organisms than the pneumococcus or to other causes is insufficient on which to base a conclusion.

C. H. M.

SOME PERSONAL EXPERIENCES WHICH HAVE STOOD THE TEST OF TIME.—BLACK, MELVILLE, Denver (*Ann. Ophth.*, Jan., 1917). The author has respect for *zinc sulphate* one grain to the ounce frequently used. In acute conjunctivitis it should be used in an eye-cup every hour for the first day or so, and then less frequently until the disease is cured. After the removal of a foreign body from the cornea the writer fills the eye with 1/3000 *bichlorid salve* and closes the eye with gauze and adhesive plaster. In his opinion, whenever the epithelium has been seriously disturbed by the foreign body or its removal, the eye should be closed until the damaged spot has healed. *Fluorescein* as a staining agent for all kinds of corneal abrasions is most valuable as a means of diagnosis, as well as the only sure method of determining the progress of a corneal ulcer, and determining whether or not the part is entirely healed. A solution is used which is made by dissolving eight grains of fluorescein to one dram of liquor potassium, and distilled water added to make one ounce. The author has come to depend upon *subconjunctival injections* of cyanid of mercury in all severe infections of the cornea, iris and ciliary body. The strength varies from 1 to 1500 to 1 to 3000, depending upon the activity of the infection. The dose should be twenty-five minims. If one-third grain of novocain is dissolved in the dose the injection is almost painless. *Iodid of silver* has been found to be of service in reducing all inflammatory conditions of the conjunctiva. The writer has found *blanching* of the *retinal vessels* by making pressure on the eyeball with the finger and observing the effect with the ophthalmoscope to be of value in detecting beginning high blood pressure.

J. M. W.

MEDICAL SOCIOLOGY

REPORT OF THE COMMITTEE OF THE CHICAGO OPHTHALMOLOGICAL SOCIETY APPOINTED FOR THE PURPOSE OF ESTIMATING A BASIS FOR ADJUSTMENT OF COMPENSATION FOR INJURIES TO THE EYE.—(*Ophth. Record*, Jan., 1917.) Class A: Vision of the injured eye,

plus vision of the uninjured eye plus stereoscopic vision plus cosmetic effect, all divided by 3.5, shall represent the ocular efficiency of the injured. This degree of ocular efficiency shall be subtracted from full compensation (100) and the result shall equal the percentage of full compensation to which the injured is entitled.

For example, a machinist is injured in the right eye and the final vision of this eye equals 0.4. The vision of the uninjured eye is normal, he has lost all but about 20% of his ability to judge depth. No external scars can be seen, then—

Factor	I=	40
Factor	II=	100
Factor	III=	20
Factor	IV=	50

$$210 \div 3.5 = 60 \text{ efficiency}$$

Compensation (100) minus efficiency (60)=40% of total compensation injured is entitled to.

Class B: Vision of the injured eye, plus vision of the uninjured eye, plus cosmetic effect, all divided by 2.5, shall represent the ocular efficiency of the injured. This degree of ocular efficiency shall be subtracted from full compensation (100) and the result shall equal the per cent of full compensation the injured is entitled to.

For example, a trench digger is injured in the right eye and the final vision of the eye equals 0.4. The vision of the uninjured eye is normal; no external scar can be seen. Then—

Factor	I=	40
Factor	II=	100
Factor	IV=	50

$$190 \div 2.5 = 76 \text{ efficiency}$$

Compensation (100) minus efficiency (76)=24% of total compensation injured is entitled to. G. I. H.

THE OCCURRENCE OF OCULAR DEFECTS AND DISEASES AT THE MASSACHUSETTS STATE REFORMATORY FOR WOMEN AT SHERBORN. —JESSAMAN, L. W., Framingham, Mass. (*Ophth. Record*, April, 1917).

The following report has to do with the occurrence of ocular defects and diseases among 438 women.

The author concludes with the statement that:

Ocular defects may be considered a contributing factor in causing delinquency in some cases, but the percentage is small.

Defective vision does not seem to play a very important role in causing mental deficiency among the inmates of the Sherborn Reformatory.

A very large percentage of the inmates require attention for correction of refractive errors or treatment of ocular diseases.

Abnormalities of the eyes should be remedied as far as possible as thereby the individual is better prepared to do her share of work at the reformatory, and, what is more important, she may care for herself better when she is sent out into the community. G. I. H.

MISCELLANEOUS

SOME ECCENTRICITIES OF INDIAN OPHTHALMIC PRACTICE.—ELLIOT, R. H., London (*Brit. Jour. Ophth.*, Feb., 1917). The writer's long practice in India has enabled him to describe from personal observation some of the curious and appalling practices common among the native *savants*. These are particularly interesting as a portrayal of the superstition and ignorance with which Western science has to deal in the East. In speaking of the diverse remedies used by native women in the treatment of the enormously prevalent conjunctival disorders, he mentions human milk, which, especially when squirted into the eye straight from the breast, has a high reputation for healing power. The quintessence of danger is found in the "laboratories" of the amateur village expert who is usually an ignorant old woman, possessed of a dark fatalism and a confidence unshaken by failures. Here are prepared the pastes or powders of the specialist, the common ingredients of which are the juice of the leaves of the tamarind tree (which is very acid and irritating), the juice of fresh limes, alum, various kinds of pepper, iron filings, human milk, human urine, cow dung and many other substances. The author says it is not difficult to imagine the harm which can be done to an eye suffering from conjunctivitis by inserting into the conjunctival sac one of these irritating concoctions. A favorite and a very evil native practice is to introduce one of these preparations into the conjunctival sac of a comatose patient, the object being to restore him to consciousness by this drastic means; as a result the cornea is frequently severely damaged.

The writer points out that the ulceration and consequent leucomata of the cornea dating from an old attack of smallpox, very often may be attributed not to local pustules but to the results of exposure, the patient having been allowed to remain on the floor of

a dusty mud hut for hours or even days, in muttering delirium or coma, exposed to desiccating influences of wind, dust and heat and the insults of flying creatures. The vaidyan sometimes uses a variety of drops; some very irritating whilst others owe their potency for mischief to contained organisms. He mentions one case, a highly educated Burman, who was advised to wash his eyes in human urine, and as a result lost his sight thereby, his urine having contained gonococci. Many of the midwives, the writer has been told, make a habit of washing the infant's eyes in the mother's urine immediately after birth. Granular ophthalmia is frequently treated by irritating powders and actual cauterization, resulting in deep scars.

The writer tells of the humorous practice of recommending that an eye disease should be treated by rubbing the sole of the corresponding foot with medicated oil (with the idea of bringing "down the heat from the head"), or by getting a friend to chew raw onions and with his mouth full of the half masticated mass, to blow on the affected eye.

Most educated Indians have their horoscope cast and consult an astrologer before entering upon an operation. In order to keep the patient's confidence, the ophthalmic surgeon often must see that the astrologer fixes as a favorable time for operation that most convenient to the surgeon.

C. H. M.

THE EFFECTS OF CINEMATOGRAPH DISPLAYS UPON THE EYES OF CHILDREN.—HARMAN, BISHOP N., London (*Brit. Med Jour.*, Feb. 17, 1917). This paper deals only with the direct effects of moving pictures upon the eyes ignoring indirect effects such as may arise from excitement, injurious atmosphere and fatigue of late hours. In general, the effects in the eyes of children are the same as those experienced by adults. The unpleasant effects associated with the cinematograph exhibition, so far as they affect the eyes, are due to the following conditions: (1) Glare; (2) flicker; (3) rapidity of motion; (4) concentration of attention; (5) duration of exhibition. None of these conditions are natural, some are peculiar to moving pictures, some occur with other optical exhibitions.

Regarding the glare the writer says that though the human eye has a wonderful power of adapting itself to varying conditions of illumination, it is well nigh incapable of adapting itself to a single light in a dark place. The light may be feeble, but if the space in

which it is exhibited be dark, it will be relatively intense, and therefore irritating to the eyes.

The flicker is peculiarly irritating and is of two kinds: First there is the effect of the rapid change of the moving film which is appreciated more by sensitive people whose "reaction time" is high than by those whose senses are duller. The effect is irritating according to the slowness of the flicker—the more rapid the change of the film, the less is the effect upon the eye. If the film can move at a rate slightly greater than that at which the keen eye is able to perceive variations of light, this sort of flicker will cease to worry. The defect is most evident now in the colored films, where attempts are made to give a natural color to the scenes by the rapid alternation of different colored films. The second kind of flicker is due to bad films having scratches and patches which allow sudden exposure of the eyes to bright flashes of light.

Undue rapidity of motion is another cause of fatigue. With the intent to reduce flicker, films are moved through the machine at a rate greater than the natural rate of progress of events depicted. The eye has a habit of work, just as any other part of the body or the whole organism, and there is a resentment expressed in terms of fatigue when it is required to work at a rate different to the habitual rate.

The concentration of effort constituting an hour's work is considered an additional reason for fatigue especially since there is no adjuvant sound or other points to divide the attention, the eye being compelled to be fully alert and constantly varying its condition according to the changes in illumination of the screen.

Finally the writer considers the duration of these shows sufficient to induce nerve exhaustion.

All of these ill effects are reduced when the observer is as nearly as possible in a line with the center of the screen and as far away from the screen as thrice its full height.

He admits that it is difficult to answer the question whether permanent defect arises from attendance at these shows especially by figures and percentages. But he thinks a recent observation has some bearing on the case: The examination of the case papers of a large number of school children, who have been referred to eye clinics on account of failure to pass the standard vision tests at the schools, shows that there is an increasing number of children who on examination at the clinic are found to have nothing the matter with them. This is probably caused by a condition of fatigue in the children so that at the time of the test they were

incapable of putting out sufficient energy, either ocular or mental, to read the standard types. Many of the children are in the habit of going to moving picture shows.

The paper concludes with the following recommendations for better protection of children: (1) The reasonable illumination of all parts of the hall not directly beside the screen. (2) The improvement of the movement of the film so as to reduce flicker, and the withdrawal of films immediately they are damaged. (3) An improvement in taking the picture so as to bring the rate of motion of the objects depicted more nearly to the natural. (4) The increase in the number of intervals in the show, and the interposition of exhibitions other than that of the optical lantern. (5) The limitation of shows for children to one hour, and the prohibition of "repeats." (6) The reservation of the children's seats to the "optimum" position in the hall. With such provisions the indulgence in a show once a week should do no harm to the eyes of a normal child.

C. H. M.

A CASE OF PITUITARY BODY DISEASE WITH REFERENCE TO THE EFFECTS OF EARLY OPERATION.—BRUNER, W. E., Cleveland (*Ann. Ophthalm.*, Oct., 1916). A strong plea is made for early recognition of pituitary disease from the ocular symptoms. A case is reported at some length of a man of forty-one who came for and was given glasses and was made comfortable for three years. He was then given additional presbyopic correction, and was comfortable for a year when he returned complaining of a little slowness in changing focus. Up to and including this examination nothing had been observed ophthalmoscopically or otherwise to excite suspicion of anything serious. His visits, however, became more frequent and he complained of slowness of focusing. The vision remained normal but the left nerve head was possibly a trifle gray. The form field was normal, but the color fields showed some contraction or temporal side of right eye, and in both was found a small scotoma for red just beyond fixation out to ten degrees. A pituitary growth was suspected and so reported to his physician and X-ray of skull advised, but nothing was done. Two months later he complained of failing ability to add up a column of figures rapidly. The vision of left eye was found to be 6/6 instead of 6/5 as formerly and the scotoma for red increased in size in a temporal direction. He also manifested a very small scotoma for white in the area of the red scotoma. Again X-ray of skull advised but was not done. About three months later vision of O. D.—6/6; O. S.

6/12. Limits of form fields normal but now there was a small absolute scotoma for white to the temporal side of fixation in each. The X-ray work was now attended to. The sella turcica was found to be somewhat deeper than normal at the posterior part, and there appeared to be some destruction of the posterior clinoid process, suggesting a tumor of the hypophysis. A Wassermann was found to be negative. He was referred to Dr. Harvey Cushing who confirmed the diagnosis of tumor of the pituitary body. He advised waiting, and use of pituitary extract, but as the symptoms increased during the following few months he operated by way of the trans-sphenoidal route and evacuated a tumor with strumas contents from the pituitary body. His recovery was prompt and satisfactory with final restoration of vision and fields except that a small red scotoma remains in each eye. M. B.

MUSCLES

CLINICAL NOTE ON ADVANCEMENTS.—MADDOX, ERNEST E., Bournemouth (*Brit. Jour. Opth.*, March, 1917). The writer believes that in an advancement, one should not be content if the tendon does not slip and attaches itself somewhere or everywhere but should endeavor to provoke its attachment to the original line of insertion. After snipping down the stump with scissors, which lessens the bulge, Maddox cauterizes the line of the original insertion rapidly, taking care that the heat does not penetrate the globe and that the endothelium behind the insertion is not disturbed. His object is thus to allow the tendon to unwind itself from the globe as naturally as possible, and with the cautery to increase the firmness of the adhesion. He suggests also, that in all tucking operations, surface cauterization of those parts of the tendon about to be brought into contact would give a firmer and more permanent cicatrix than scraping the tendon. C. H. M.

DEMONSTRATION OF MY NEW CONCEPTION OF THE OCULAR MOVEMENTS.—GEORGE, EDGAR J., Chicago (*Jour. Ophthal., Otol. and Laryngol.*, Dec., 1916). Last year he presented a paper entitled, "A New Conception of the Ocular Movements With a New Strabismus Operation Based Thereon." Exceptions were taken to his theory and a committee was appointed by the O. O. and L. Society to investigate and report upon the author's contentions. He contends that the accepted theory that the center of ocular rotation is within the globe is wrong and that the eye does not rotate about a given center but that it oscillates from a fixed point and

that this fixed point is the maculae. He maintains that Tenon's capsule serves as a sling, a hammock or foundation on which the eyeball rests. He states that if it were true that the center of ocular rotation was the center of the eyeball that when the eye was turned outward 50° the posterior pole of the eye would be rotated inward 50° and that this is anatomically impossible because the optic nerve is not long enough to admit of such an excursion without stretching. He goes on to show that the anterior part of the eye oscillates from the macular center, that the optic nerve has no movement, that the eye does not rotate in Tenon's capsule but that this capsule moves with the eye and that the conformation of the anterior bony walls of the orbit show that they were fashioned to admit of the oscillatory movement of the globe. He also maintains that the oblique muscles have nothing to do with tilting of the eye, but that their action is limited to rotation. He exhibited dissections and models to prove his claims.

The committee appointed to investigate the claims of Dr. George consisted of Drs. W. O. Bell, Dean W. Myers and J. A. Ferree.

Dr. Ferree was assisted in his investigation by Chas. Sheard, Ph. D. of the Department of Applied Optics of the Ohio State University, Department of Ophthalmology of the Homeopathic College. Their report is a very elaborate and highly scientific exhibit which makes the contentions of Dr. George impossible insofar as geometry and trigonometry can prove anything. The report, however, of Dr. Dean W. Myers of Ann Arbor proved to be a death blow to the theory of oscillation. He found a man with an eye which needed to be enucleated and who was willing to lend himself to a practical demonstration of ocular movements. His eye was accordingly rendered anesthetic in front by cocain and behind by the injection of novocain. The eye was then pierced with a heavy needle from front to back, the aim being to pass it through the path of the anterior-posterior axis. A shot was then fastened on the needle at the cornea. An X-ray plate was then placed under the chin of the subject, his gaze directed to the extreme temporal and the exposure from above made for five seconds; the patient's gaze was then directed to the extreme nasal and a second exposure made on the same plate for five seconds. The result of numerous such exposures in different positions was the same in all, namely the needles were crossed and measurements of the eye, which was then enucleated showed the crossing was about $1\frac{1}{2}$ mm. back of the geometric ocular center. All of which, by the way, supports Savage in his contention that the center of retinal curvature is the center of

ocular rotation. This demonstration knocked George's theory into a cocked hat, and the meeting voted that the report of the committee be accepted and that Dr. George's contention be considered as not having been proved. M. B.

A CASE OF CHRONIC EYE STRAIN PROMPTLY CURED BY TRAINING OF THE FUSION FACULTY.—LINNELL, E. H., Norwich, Conn. (*Jour. Ophthalm., Otol. and Laryngol.*, Jan., 1917). It is his belief that the influence of defective fusion faculty in the causation of muscular imbalance, and as a factor in the development and perpetuation of asthenopic symptoms does not receive the attention it deserves at the hands of the majority of ophthalmologists. Imperfectly developed or absent fusion faculty tends to the establishment of an aggravation of muscular errors, and is an important factor in difficult and painful use of the eyes. In dealing with this condition his experience is limited because of the time it requires, and the difficulty of securing the requisite perseverance on the part of the patient; also and perhaps chiefly, because in the majority of cases, he secures satisfactory results in easier ways.

A case is reported of a neurotic girl of twenty-one who had been the rounds of oculists of repute. She complained of nearly constant headache, lachrymation, cramps in the facial muscles, a sensation as though eyes were being drawn back into head and an entire inability to use them for near work. She had a moderate error of hyperopia with astigma with Es. 1° for and 4° near. Convergence power 14° , but she had no binocular vision at the reading distance as was evidenced by the stereoscope and bar reading. She was given a stereoscope with series "a" of Dr. Wells' for home use, was told to tie up the right eye for an hour each day because the left eye was becoming amblyopic, and to use the taper exercise for the interni. In a week's time her report was encouraging. After three days' use of the stereoscope with no result, suddenly she was able to fuse all of the cards with discrete images. Then she disclosed Es. 5° distance, and Ex. in accommodation of 4° . Treatment was continued and a week later she reported that bar reading was easy and that she could read 20 minutes without fatigue. She was free from headache and twitching of eyes. She could fuse all of Wells' series of cards except the last three numbers of Series H. Es. 2° far; orthophoria near. The treatment was discontinued except for the taper exercise and bar reading. At her next visit she reported that her eyes were "all right" and that she could use them as much as she wished. She was found

to have perfect fusion. She was discharged with instruction to continue bar reading for an hour a day. M. B.

OPERATIONS

A METHOD OF OPERATION IN COMPLETE OBLITERATION OF THE ANTERIOR CHAMBER WITH REPORT OF A CASE OF CORNEAL STAPHYLOMA.—DARLING, C. G., Chicago, Ill. (*Ophth. Record*, Feb., 1917). Heine's cyclodialysis operation was done opposite the widest area of sound corneal rim.

The spatula when in the anterior chamber separated the iris from the cornea; it was passed forward until the iris was somewhat torn from the corneal rim (the spatula being well curved so that it hugged the back of the cornea).

With the point of a keratome using sawing movements the spatula was cut down upon well back in the limbus so that the cornea would be left untouched and the iridectomy would be well to the root of the iris to give good drainage.

This incision was enlarged with scissors but a canaliculus knife if very sharp would have been better.

The iris forceps were now introduced, the spatula removed, and an iridectomy of about 3 mm. wide was made at the first attempt. To make the iridectomy wider the spatula was re-introduced to get the iris forceps between the iris and cornea; this was done on one side and then the other of the primary attempt, giving an iridectomy of over 10 mm., wide well back at the root of the iris. G. I. H.

THE USE OF EYES OF KITTENS IN OPHTHALMIC OPERATIVE TEACHING.—FISHER, W. A., Chicago (*Ann. Ophthal.*, Jan., 1917). He has found pig's eyes and sheep's eyes unsatisfactory for operative purposes. This fact prompted the author to find some animal where the cornea and iris, at least, were analogous to those of the human. His experiments have included practically every available small or domestic animal. For muscle work the eyes of the dog were found to be the most satisfactory, but for work upon the eyeball proper the eyes of kittens were found the most satisfactory. In kittens from four to five weeks old and weighing from 20 to 24 ounces the size and thickness of the cornea, depth of anterior chamber and texture of iris will be found analogous in every respect to those of the human eye. The availability of material is easy to arrange for.

The technic. The kittens should be killed by an intrapleural

injection of one-half grain of strychnia. The lids and nictitating membrane should be cut away, as they interfere, then do tenotomies on the muscles and then enucleate it and place in a mask for cataract work. He tells how to make a mask out of a cigar box. The lid is removed and fastened to the bottom with nails or glue. Locate two points on the reinforced bottom, three-fourths inch from either side and one and one-half inches from one end. At these points burn holes with a hot poker not to exceed one-quarter inch in diameter, and cautiously enlarge them to one-half inch, taking care not to burn too deeply into the wood. Strive to make a concavity in which to have the eye rest snugly, and at the same time have enough of the bottom of the box behind it to prevent its drawing through when fixed in position. Drill two more holes near the free edges of the box opposite those on the bottom, large enough to accommodate a lead pencil. Slot one of the holes and make a key to fit the slot to prevent the pencils turning. Flatten one or two sides of the two sides of the pencil, and the mask is ready for use as follows: Pass a thread through the scleral tissue near optic nerve and drop ends through one of the burned holes and make one or two overlapping turns over the pencil below and then turn pencil until the eye is drawn snugly into the cup made for it and until the tension of the eye as registered by the tonometer is about normal. With the eye thus fixed the regular cataract procedures may be taken up. This mask may be obtained from Mueller & Co. of Chicago if desired. The author now gives a description of his method of removing the lens in its capsule and says with 100 kittens eyes the technic can be mastered. M. B.

AN INTRANASAL OPERATION FOR LACHRYMAL OBSTRUCTION WITH SIMPLIFIED TECHNIC.—BAUM, HARRY L., Denver (*Ann. Ophthalm.*, Jan., 1917). A very simple operation is presented in which a flap of mucoperiosteum is raised over an area $1\frac{1}{2} \times 1$ cm. wide situated just anterior to the anterior attachment of the middle turbinate bone. This flap is excised. He has devised two curets, right and left, whose bowl like cutting surfaces are placed at an angle to the shaft. Just in front of the thin lachrymal bone to be curetted away is the hard ascending process of the superior maxillary. It is easy to feel one's way over this hard bone to the yielding, thin lachrymal bone and curette it away. If a lachrymal probe is previously passed through the canaliculus into the duct, it affords a land mark in the sac, as well as a background upon which to curette when removing the nasal wall of the lachrymal sac. By

manipulating the end of the probe in the sac the edges of the mucous-membrane of the sac can be pushed into view in the nasal fossa and excised.

M. B.

OPTIC NERVE

COMPLETE, BILATERAL OPHTHALMOPLÉGIA WITH CHOKED DISCS.
—BLAKE, EUGENE M., New Haven, Conn. (*Ophth. Record*, Feb., 1917). The patient, a shop girl aged 18, of Russian parentage. Fundus examination revealed an intense swelling of both nerve heads, with no hemorrhages or exudates into the retina. The optic nerve fibers were swollen so that the disc projected approximately five dioptries into the vitreous in each eye. The veins were distended and at points where they bent around the enlarged discs entirely disappeared from view. There was no perception of motion or even of light in any part of the retinae so far as could be determined.

The patient was kept in bed, cathartics given and ten drops of saturated solution of potassium iodide given three times a day. The vision increased in both eyes to 20/20. There remains a considerable pallor of the nerve heads, more marked in the left. Color perception is normal and the patient is free from any symptoms, except an occasional headache.

G. I. H.

SOME ETIOLOGICAL FACTORS OF RETRO-BULBAR OPTIC NEURITIS.
NAGLE, FRANK O., Philadelphia (*Jour. Ophthal., Otol. and Laryngol.*, Jan., 1917). He regards retro-bulbar neuritis as an inflammation of the maculo-papular bundle of nerve fibers. Alcohol and tobacco and multiple sclerosis form the two most conspicuous causes. Diseases of the accessory nasal sinuses have played an important part in causation during recent years. Just how the optic nerve becomes involved is not definitely settled.

M. B.

ORBIT

A CASE OF SEROUS TENONITIS AND ONE OF ORBITAL CELLULITIS.
—MCBEAN, G. M., Chicago (*Jour. Ophth., Otol. and Laryngol.*, March, 1917). A woman of sixty-seven presented a paralysis of the external rectus muscle, with accompanying oedema of the ocular conjunctiva. General symptoms of muscular rheumatism and high blood pressure. It soon cleared up under Kali iodide and sodium salicylate. A month later she awakened one night with intense chemosis of left ocular conjunctiva so that she could not close the eyelid. It was necessary to take a couple of Snellen sutures through

the lid in order to repose the oedematous lower lid. Treatment with iodides and salicylates was continued, multiple puncture of the oedematous conjunctiva and a pressure bandage was applied. In a few weeks the symptoms had gone except for a slight congestion of the conjunctiva. Her vision was not impaired.

Case 2. A child of 3 for three days had a swelling of left eyelid accompanied by a marked proptosis and temperature of 100-102°. Some pain which was intermittent. Rhinitis on same side with watery discharge. Deep orbital probing through lid incisions above and below were made but no pus was found. A few days later a swelling formed in region of lachrymal sac. It was incised and a drainage tube inserted, but no pus followed. The case got well in a few weeks without any drainage of pus. M. B.

REFRACTION AND ACCOMMODATION

A CLINICAL CONSIDERATION OF MIGRAINE.—LITCHY, JOHN A., Pittsburgh, Pa. (*Ophth. Record*, April, 1917). Migraine is considered by the author as the most frequent headache, occurring in 700 of his 15,000 patients sick from all causes. While the underlying causes of migraine are vague and furnish little light as to treatment, much can be done to ameliorate the symptoms by proper handling of the exciting causes that aggravate the patient's general condition and precipitate the attacks. Most thorough investigation and careful individualization are indicated. Systemic administration of the bromide salts and avoidance of undue fatigue are especially recommended. G. I. H.

ON THE RULES FOR THE CORRECTION OF ASTIGMATISM.—NORDENSON, J. W., Stockholm (*Brit. Jour. Ophth.*, March, 1917). Although the question, whether in a given case the astigmatism of an eye should be corrected or not, occurs daily, in view of the fact that it has been little debated in ophthalmic literature and directions on the subject in text books are vague, the writer ventures to review shortly the rules concerning this subject.

He thinks when correction improves visual acuity, it is advisable when there is need of accurate detail-vision, and points out that, although a visual acuity considerably below normal is sufficient for most occupations, yet, the more accurate the visual perceptions are, the better. Accommodation asthenopia is also mentioned as an indication for correction—some ametropes, in order to improve definition, accommodate in excess of what gives the proper focal

distance; this spoils definition; therefore the patient relaxes accommodation, the pupil widens and he reverts to accommodation. Such an alternation where long continued produces strain. Asthenopia, due to strain of the orbicularis muscle, produced by its efforts to correct astigmatism by exerting pressure in a vertical direction on the globe, may constitute an urgent need for cylindrical glasses, likewise that form commonly thought to be a cause of nervous troubles. The writer advises the correction of astigmatism when strabismus is imminent, since it is often due to the fact that the faculty of fusion is strained at the time the desire for single vision is diminished, as when if one eye has less sharp retinal images than the other; the defective eye, in which the images have been suppressed, is then left to take the position most convenient to its muscles.

As contraindications to correction Nordensen includes: the inconvenience of wearing glasses, as when one eye is normal and the other, astigmatic; the non-improvement of visual acuity after the use of glasses for some time; and also intolerance of correction, which at times cannot be overcome in elderly patients in whose eyes the axes of the optical system do not coincide with the vertical and horizontal plane; such patients being accustomed to distorted images and often continuing to misinterpret the correct retinal images after correction, should be given a weak cylinder first. The writer, in referring to the article by LaGrange in which the correction of hypermetropic astigmatism so often found in children is not advised unless it be causing trouble, points out that the possibility of self-cure by leaving the astigmatism uncorrected is insufficient to contra-indicate correction in these cases. In conclusion mention is made of the fact that the above indications and contraindications do not exhaust the list but must be weighed one against the other according to individual needs of every case.

C. H. M.

THE USE OF CYCLOPLEGICS IN REFRACTION WORK. — CLARKE, ERNEST E., London (*Med. Press*, Feb. 21, 1917).

The writer avers that it would seem almost unnecessary to expatiate upon the importance of the employment of cycloplegics in estimating refraction, but for the late contrary view expounded every now and then. He believes that anyone who states that a cycloplegic is never necessary, does not appreciate the very essentials of the question of eye-strain; in the absence of a cycloplegic, a different result can be obtained every time the refraction is tested

and it is impossible to determine accurately the exact amount or axis of a low power cylinder. To prove his statements, the author has carefully worked out the refraction of many young patients before and after a cycloplegic was used; in no single case did the post-cycloplegic correction tally with the preliminary test. He maintains that though large errors take care of themselves, the careless correction of such errors resulting in the prescribing of glasses which are very nearly, but not quite right, is liable to induce eyestrain which perhaps never existed before, because the ciliary muscle is now able to correct the small deficiency that is left, whereas it could not deal with the larger error. He fears that many ophthalmic surgeons omit the cycloplegic because they will not take the necessary trouble and although they spend hours over an obscure form of retinal disease which they cannot alleviate, they fail to appreciate that with a little extra care and time with their refraction cases, they can turn a life of misery into one of comparative happiness.

C. H. M.

CYCLOPLEGICS IN THE MEASUREMENT OF AMETROPIA.—JACKSON, EDWARD, Denver (*Ann. Ophth.*, Jan., 1917). A very liberal and broad view is taken of the good that the various methods contain of measuring refraction errors. He does not condemn the man who does not use a cycloplegic but he thinks he is not availing himself of a method which gives him the full refraction error with the accommodation suspended. He regards this knowledge as valuable. He thinks the temporary accommodative rest is helpful to a tired or inflamed eye and that the maximum light effect may be productive of lessened photophobia after the pupil has resumed the normal. The choice of a cycloplegic with him is one that he can use personally in his office. Where the drug is prescribed for home use it is uncertain that it will be effectively used and the result is doubtful cycloplegia. He therefore prefers homatropin and with it rarely fails to get accommodative paralysis. The disadvantages of cycloplegia are disability for near work, photophobia, the possibility of exciting a glaucomatous attack and unpleasant constitutional and local symptoms. The possibility of glaucoma is the only one of much importance. He thinks that care in taking the history and a previous ophthalmoscopic examination should practically eliminate this danger, together with the use of a myotic before the patient leaves the office in all cases going immediately out of town or from under your observation. He thinks the advantages offset the disadvantages and that the latter constitute the price the

patient has to pay to get them. He finds that we have to pay in some way for most things worth having. M. B.

HIGH HYPEROPIA FROM A CLINICIAN'S STANDPOINT.—HANSELL, HOWARD F., Philadelphia (*Ann. Ophthal.*, Oct., 1916). Vision of full acuity cannot always be obtained, but it is not incompatible with a perfect correction. Each case in which either a part, or all of the hyperopia, is latent, presents a problem by itself. Patients having the extremes of hyperopia are more likely to wear full correction with comfort. In the majority, deductions must be made for the sake of both satisfactory vision in the distance and the avoidance of sudden change of relations between accommodation and convergence. Some people after years of adaptation to the disassociation of convergence and accommodation incident to hyperopia accept a part or full correction of the error and at once adjust themselves to the new conditions. Other people never do. They frequently return for readjustment and the increase or reduction of the sphere or change in the strength of the cylinder or its axis is apparently indicated. Differences in the accommodative range of the two eyes may require some modification of the glass to be worn at both far and near. The inconsistencies in two persons of the same age, sex and methods of living, with practically the same optical defects, may be temperamental, a factor which must be reckoned with. Inaccurate grinding and adjustment of the lenses may affect the work of the oculist and is not to be overlooked when hunting for causes of nonrelief. M. B.

HIGH REFRACTIVE ERRORS AMONG SCHOOL CHILDREN.—WESSELS, L. C., Philadelphia (*Jour. Ophthal., Otol. and Laryngol.*, March, 1917). As ophthalmologist to the Philadelphia Bureau of Health he has refracted some twenty thousand children. He found in one family of six children that each had hyperopia of not less than fourteen and not more than eighteen dioptries. He saw one family of myopes (colored) where the youngest of six with six dioptries of myopia and two of astigmatism and the oldest of eight had seventeen of myopia and three of astigmatism. The two children between having myopic errors above eleven diopters. The highest myopia he saw was in a child of fourteen who was wearing —27.00—4.00 ax. 180. The seriousness of myopia in school children is not appreciated by our educational authorities. Close work should be reduced to a minimum and all home work and reading at night should be forbidden. The teaching of myopic children

should be oral and their training vocational and manual, such books as are indispensable should be printed in large type on a mat surface. Special classes should be established for the teaching of myopic children. The regular classes are detrimental to the child's future; it would be better to take it out of school rather than to jeopardize its sight. Myopic children, as a rule, are good scholars, because of being deprived of the health producing sports from poor vision. They have no difficulty at the near point, hence their enjoyment is in books. Many of them will not wear their glasses. If a child will wear its glasses constantly before the myopia has progressed, progression is often prevented. Special classes for the teaching of myopic children or those suffering from other high grade refractive errors are more important than special classes for the teaching of the mentally defective.

M. B.

COMBINED USE OF CROSS CYLINDER AND ASTIGMATIC DIAL.—CRISP, WM. H., Denver (*Ann. Ophthal.*, Jan., 1917). The cross cylinder is at times found to be rather decidedly misleading and uncertain; this being seldom the case as regards determination of the axis, but more frequently so concerning the strength of cylinder required. He thinks this is explained as follows: Since letters arranged in horizontal series or lines tend to appear to blend more or less with one another when elongated horizontally, and to be more separated from one another when elongated vertically, many patients are disposed to select as clearer that position of the cross cylinder in which the vertical elongation occurs. This position is the one in which the effect is that of a plus cylinder held with its axis more or less horizontally, or what amounts to the same thing, of a minus cylinder held vertically. It is less likely to arise with a patient fully under a cycloplegic. When encountered we have the effect of a reduction in the apparent amount of direct astigmatism present, or an increase in the inverse astigmatism. After arriving at an approximate estimation of the spheric correction he places the ordinary clock dial before the patient and asks which line is most distinct and then rather quickly reaches an approximation of the strength of the cylinder. He then uses the cross cylinder to obtain an exact placing of the axis. Then with the Thomas astigmatic chart the principal meridians are exactly estimated. In many instances, after preliminary use of the retinoscope, the Thomas revolving chart is the only one resorted to.

M. B.

RETINA

A NEW METHOD OF TREATMENT FOR RETINAL SEPARATION.—VERHOEFF, F. H., Boston, Mass. (*Ophth. Record*, Jan., 1917). The retina is first replaced by means of scleral puncture or other measures and the patient then kept in bed with both eyes bandaged for about a week. A large number of minute punctures through the sclera and retina are now made by electrolysis. At the site of each puncture the retina becomes intimately fused with the chorioid and sclera as a result of the slight inflammatory reaction set up. The procedure may be carried out under cocaine anesthesia and is not actually painful, although very unpleasant to the patient. I have employed a small steel half-curved eye needle, the current being obtained from a series of six dry batteries of $1\frac{1}{2}$ volts each. The positive electrode in the form of a wet sponge is applied to the cheek. The conjunctiva is not dissected back, but the punctures are made directly through it. The slight conjunctival reaction resulting is of no importance. The needle point is pressed firmly against the globe until it penetrates the wall, when it is pulled back slightly so that the point protrudes only a millimeter or two into the vitreous, and then allowed to remain about five seconds. It requires about one-half minute for each puncture. The patient is afterwards kept in bed for about ten days to allow time for the retina to become firmly adherent.

G. I. H.

SINUSES, NOSE AND EAR.

THE CASUAL RELATIONSHIP OF DEFORMITIES AND DISEASES OF THE NOSE AND THROAT TO DISEASES OF THE EYE, WITH SPECIAL REFERENCE TO ASTHENOPIA.—STAUFFER, FRED, Salt Lake City (*Ann. Ophth.*, Jan., 1917). When symptoms of asthenopia are not relieved by correction of the ocular error the nose should at once be investigated and if anything there is found wrong it should be corrected. Septal deformities and pressure in the middle turbinated region are especially prone to cause such symptoms.

When seeking the cause of ocular inflammations the nasal accessory sinuses and tonsils should never be overlooked. Both may be diseased and if so they should be surgically corrected.

The author thinks that rheumatism is responsible to the tonsils or nose and that it should no longer be spoken of as the cause of ocular disease but that it is only another symptom emanating from the same cause as the ocular disease.

M. B.

INTIMATE RELATION BETWEEN THE EYE AND THE EAR, NOSE AND THROAT, WITH REPORT OF SOME UNUSUAL CASES.—BECK, JOSEPH C., Chicago (*Ann. Ophthalm.*, Oct., 1916). A report is made of a number of cases he has seen in which a causal relation existed between either the nose, throat, ear and the eye. One case is reported in which severe labyrinthian disturbance with nystagmus was relieved by the correction of a refractive error. Laying off of the glasses would occasion a recurrence of the labyrinthian symptoms. Another case almost the reverse of the one just mentioned was in a man who had tympanic fluid, with dimness of vision. When the fluid was removed the vision would come up to normal and recede again when the tympanic fluid was allowed to reform.

The case of a boy of four is reported who had ethmosphenoiditis with orbital cellulitis simulating cavernous sinus thrombosis. An abscess in the orbit was opened and drained with a clearing up of all his symptoms.

Another of his cases was one of infected ethmoidal cyst with periodic exophthalmos in young woman of twenty. The orbital tumor was opened through the lid and drained and later an intranasal procedure was done to get rid of the diseased cells which were responsible for the orbital trouble. A very interesting report is made of a case of recurrent unilateral iritis of eighteen years duration. The author first saw the young man twenty years ago and since that time the patient consulted experts in many departments of medicine in various parts of the world. Everything was done to run down and remove the cause of his eye trouble but without permanent results.

A case is reported of nonsuppurative sinusitis causing blindness from diffuse edema of the retina. The lady was thirty years old and gave a history of la grippe followed in six weeks by failing vision. The nose showed evidences of nonsuppurative sinusitis with deflection of septum high up anteriorly. An X-ray of sinuses showed a typical rarefaction of the ethmoidal labyrinth. A submucous resection was performed with complete exenteration of the ethmoidal cells with middle turbinectomy and exploration of frontal, antral and sphenoidal sinuses. Vision improved at once and in a short time was normal.

The case of a man aged 71 is reported at great length, who had a tumor of the hypophysis complicated by symptoms of mixedema from inadequate thyroidal secretion which came to autopsy and confirmed the diagnosis of hypophysis tumor.

The author gives a full description of his method of operating upon the sella turcica by way of the antrum of Highmore and the nose. He also details his experience with the various methods of operating upon suppuration of the lachrymal sac. He has apparently tried all the methods of dacryocystorhinostomy both from the nasal and ocular routes and seems to conclude that failures are prone to follow quite often in all methods devised to establish a normal flow of tears into the nose.

The last part of this interesting paper deals with the nasal pathology of the structures responsible for ocular complications.

M. B.

METASTATIC CHORIOIDITIS FOLLOWING MASTOIDITIS.—SCHENCK, H. D., Brooklyn (*Jour. Ophthalm., Otol. and Laryngol.*, Nov., 1916). A woman of thirty-eight who had been taking care of her child through an attack of scarlet fever was attacked by an acute otitis media one night with perforation following in a few hours. Ear ache in childhood had been common but the attacks had never been attended by discharge. She therefore did not consider this attack as important until recurrence of pain and high temperature for two nights caused her to call in her physician, who in turn called the author in consultation. On the fifth day the temperature having been as high as 104° F. with tenderness over the mastoid antrum, she was moved to the hospital for a mastoid operation which was performed and pus found in the cells and antrum. Just before the operation the pupil of the right eye was noticed to be larger than that of the left and the ball was injected and pus was found in the conjunctival aperture. This condition went on from bad to worse and proved to be a purulent chorioiditis. Perforation of the globe occurred and the eye was enucleated as soon as it was safe to do so. The patient made an uneventful recovery from both the mastoiditis and the ophthalmitis. The infection was streptococci. In view of the mother having been subjected to the infection of scarlet fever from her child the author thinks she may have been infected and that it expended itself on the ear and that the ocular infection was metastatic. The high temperature continued for four days after the mastoid operation and there was later a free desquamation from her hands and feet.

M. B.

THE RELATION OF EYE DISEASES TO DISEASES OF THE ACCESSORY SINUSES OF THE NOSE. A REPORT OF A STUDY OF ONE CASE.—KEARNEY, J. A., New York (*Jour. Ophthalm., Otol. and Laryngol.*,

Nov., 1916). The eye conditions that should prompt us to examine the accessory sinuses of the nose, are: Monocular exophthalmos, monocular rapid loss of vision, monocular papilledema, monocular oedema of the lids associated with severest headaches, and asthenopic symptoms where the eye conditions are not found responsible. The sinuses responsible in point of frequency are, the frontal, anterior ethmoidal and maxillary. In frontal sinus ectasias, or inflammation, the globe is pressed forward, downward and outward; anterior ethmoidal involvement displaces it forward and outward and maxillary forward and upward. The sphenoid and posterior ethmoid are responsible for optic nerve disturbances because of their distribution along the optic canal. The case of a young woman was reported who had monocular displacement forward and outward with blurring of disc margins above, below and nasally. L. V.=20/cc. X-ray pictures showed a large ethmoid sinus on that side. Tenderness on pressure over the left anterior ethmoid region. The left middle turbinate congested and pressing upon septum and lateral wall. After cocainization and adrenalization, creamy purulent matter flowed down between middle turbinated body and lateral wall. The treatment consisted in external hot applications, steam-inhalations and left nares was cocainized and adrenalized once daily. The exophthalmos disappeared in five days and the ocular motions returned to normal with normal vision.

M. B.

TEETH

TEMPORARY LOSS OF VISION DUE TO A DISEASED TOOTH.—BOYLE, CHAS. C., New York (*Jour. Ophthal., Otol. and Laryngol.*, Nov., 1916). Young woman who complained of sudden failure of vision of left eye. The vision was found to be reduced to 20/40. She had a bad tooth root on that side. It was extracted and found to have an abscess at its base. In a month's time the vision was normal.

M. B.

EYE SYMPTOMS SECONDARY TO FOCAL INFECTIONS.—WYNN, J., Louisville, Ky. (*Jour. Ophthal., Otol. and Laryngol.*, Feb., 1917). The importance of good team-work is necessary if we are to get at the root of the trouble, which may be in the teeth, tonsils, intestinal tract, or urinary organs. The eye symptoms may vary from a mere temporary blurring of vision to the most severe inflammation of the iris, ciliary body, optic nerve or glaucoma. Extension of inflammation through the thin walls of the nasal acces-

sory sinuses by continuity especially to the optic nerve where it passes through the foramen. A mere cursory examination of the nose will often fail to reveal sinus disease that is causing the most severe focal symptoms. He has found the use of argyrol tampons as advocated by Dowling of great value. If the sinus is affected there will be a free flow of muco-pus, and the tampon will be discolored. It is also a good form of local treatment. M. B.

THE RELATION OF THE MOUTH TO OCULAR DISEASES.—FINNOFF, WM. C., Denver (*Annals of Ophth.*, Jan., 1917). Eye diseases secondary to pathological conditions in the mouth occurs in one of three ways. First, by bacteria or their toxins; secondly, by reflex irritation; and thirdly, by combination of both. In the first instance some localized area of infection in the mouth will be the underlying cause. It may be pyorrhea alveolaris, alveolar abscess, decayed teeth, periapical abscess, infected root canals, poorly adjusted crowns or bridges, and fillings with overhanging infected margins. Reflex irritation may be produced by impacted teeth, pulp stones, dental cysts, sensitive decayed teeth, broken instruments, or other foreign material which have been introduced accidentally into the roots, bone, or soft tissue by dentists.

The only possible modus of deep seated eye inflammation infected from the mouth lesions is hematogenous, for the lymphatics of the mouth drain into the mandibular and cervical glands. Extension along the perineural spaces is improbable. Extension through the periosteal and osseous channels, if it ever occurs, is very rare. Most ocular inflammations are produced by indirect metastasis, the infecting agents traveling through the general arterial circulation and ultimately infecting the eye.

Pyorrhea alveolaris, with its large area of infection, and in later stages, with deep seated pockets, which drain with difficulty, is probably the most frequent underlying oral cause of inflammatory ocular lesions.

Rosenow has called our attention to the *selective action* of bacteria for certain tissues. He found that streptococci obtained from the appendix most often produced lesions in that organ in animals into which they have been injected. He also found that streptococci isolated from arthritis, more often affected the eye than those isolated in gastric and duodenal ulcers, appendicitis and cholecystitic. Does it not seem reasonable to suppose that the strains of streptococci, staphylococci, pneumococci, and other organisms which

have made the mouth their habitat for a long period of time, could be so altered as to possess selective affinity for the tissues of the eye? Eye diseases which are supposedly secondary to the mouth in persons having suppurating nasal sinuses, either primary or secondary to the teeth, cannot be expected to show marked improvement by treating the mouth alone, but attention must be directed to the nose as well. The close communication between the eye and the mouth through the sensory nerve readily explains the reflex pains and so-called neuralgia of the eye and orbit, produced by impacted teeth, pulp stones, and other conditions enumerated above. Correction of the cause of irritation is the only hope for the cure of these distressing reflex symptoms. J. M. W.

TOXICOLOGY

AFFECTIONS OF THE EYES FROM INTOXICATION BY METHYL ALCOHOL.—BIRCH-HIRSCHFELD, A., Königsberg i. Pr. (*Medic Klinik*, 1916, No. 9, abstract in *Centralbl f. prakt. Aug.*, 40, p. 191), reports 2 cases. An orderly who, after taking a small quantity of liquor, fell ill with visual disturbances, vomiting, and diarrhea. Both eyes showed a small central scotoma, while the peripheral borders of the visual fields for white and colors were normal. The discs were pale and slightly veiled, and remained so, but vision of left eye gradually improved. After 8 months the patient could resume his military service.

The second case was more severe. A soldier drank with 4 other soldiers about 50 grammes of liquor, obtained from a drug store. The next day the 4 soldiers died, and the first complained of visual disturbances, lost consciousness and, on the third day, awoke totally blind. An examination a few weeks later revealed maximal mydriasis, pallor of the optic discs, whose borders were slightly veiled, normal macula, V reduced to counting fingers, concentric contraction of the visual fields for white and inability of recognizing colored objects of 12 mm. diameter, absolute central scotoma of right eye extending about 25° downward, about 10° to the side.

The so far published cases of intoxication by methyl alcohol show that individual predisposition plays an important part, the ocular disturbances are no constant symptom and the intoxication occurs not only from the digestive tract, but also by inhalation of the vapors of methyl alcohol. Most cases had in common a latent period of relative euphoria, hours pass before the first intoxication symptoms in the digestive tract set in. The visual disturbances usually commence previously to severe general phenomena and

even in cases, in which the latter precede the impairment of sight, the wide immobile pupil may point to the lesion of the visual organ. The optic neuritis has nothing characteristic of this kind of intoxication. Retinal hemorrhages are rare. The diagnosis becomes essentially more certain if in the stage of recovery a central scotoma is found. The improvement of the visual disturbance is very slow. Careful examinations of the visual field, the fundus and vision will indicate whether one has to deal with a severe case ending in blindness or a lighter one. Recurring contraction of the visual field after previous expansion is unfavorable for the prognosis, conversion of an absolute into a relative central scotoma favorable. During the improvement of vision the redness and haziness of the disc pass into pallor of the temporal portion. According to B.'s experiments on animals methyl alcohol causes degenerative changes of the nerve fibers and ganglion cells of the retina with no signs of inflammatory infiltration. Treatment is of little avail, and prophylaxis is much more important. C. Z.

QUININE AMAUROSIS WITH REPORT OF A CASE.—BALLANTYNE, ARTHUR J., Glasgow (*Brit. Jour. Ophth.*, March, 1917). In addition to reviewing the history and clinical aspect of the "typical" case of quinine blindness, and relating what is known of its pathological histology, the writer reports a case which differs from the great majority of those hitherto published, in that, although the patient was first seen four days after the administration of the quinine, a further period of five days elapsed before the characteristic ischaemia of the disc and retinal vessels made its appearance, a feature which he assumes may have some bearing on the pathogenesis of the condition.

In summarizing, the writer points out that a consideration of the subject in the light of the case reported, entitles him to conclude: (1) That in quinine poisoning complete loss of vision may be found in association with a normal condition of the fundus oculi, and that there may be a striking recovery of vision in spite of the presence of well-marked fundus changes. (2) That in all, or nearly all, cases of quinine amaurosis, ophthalmoscopic changes, such as congestion of optic nerve and retina, pallor of the disc, narrowness of the retinal vessels, and cloudy opacity of the retina, make their appearance sooner or later, but there is no correspondence between the character of severity of these changes and the intensity of the visual defect. (3) That the visual defect cannot, therefore, be due to such changes, but rather to a condition of the

retinal elements invisible with the ophthalmoscope. (4) That this change may be induced, or aggravated, in the first place, by ischaemia due to contraction of the vessels of the optic nerve and retina, but that it is, in the main, the result of a direct toxic action of quinine upon the retina itself, and that the ultimate recovery of central vision, with loss of peripheral vision, and failure of vision in twilight, suggests a selective action of the poison upon the rods.

C. H. M.

TRACHOMA

TRACHOMA: A DISEASE OF EQUAL IMPORTANCE TO THE OPHTHALMOLOGIST AND PUBLIC HEALTH OFFICER AND WHAT THE GOVERNMENT IS DOING TO ERADICATE AND PREVENT ITS FURTHER SPREAD.—McMULLEN, JOHN, Lexington, Ky. (*Jour. of Ophth. and Oto-Laryngol.*, February, 1917).

According to the author we are beginning to realize that our own country harbors the infection to an alarming extent and there is plenty of evidence that this disease is on the increase. A routine examination of our Indian reservations by the Public Health Service showed that many of them were heavily infected and the disease has also been found in various sections of the country. Trachoma is found extensively in the Appalachian Mountains, with the heaviest infection where the states of Kentucky, Virginia, West Virginia and Tennessee are adjacent.

A survey made by the Service in 23 counties in eastern Kentucky showed that 1,280 out of a total of 18,000 people examined were suffering from trachoma—that is, about 7 per cent of the total number examined had trachoma. Of the number examined in this survey, 16,696, were school children.

G. I. H.

TUMORS

AN UNUSUALLY LARGE OSTEOMA OF THE FRONTAL, ETHMOIDAL AND SPHENOIDAL SINUSES INVOLVING THE ORBIT AND ANTERIOR CEREBRAL FASSA, PRESENTING NO SUBJECTIVE SYMPTOMS OTHER THAN PROPTOSIS OF THE EYEBALL.—VEASEY, C. A., Spokane, Wash. (*Ann. Ophth.*, Oct., 1916). The title covers the ground fairly well in this case, except that the patient was a woman aged thirty and had been aware of the proptosis for eleven years. The pupil of the proptosed eye was larger than its fellow and a little sluggish. A skiagraph showed the bony growth to be as large as a medium sized hen's egg and that it extended into the cerebral cavity in the anterior cerebral fassa, giving a shadow fifty-eight mm.

long by twenty-five mm. broad. The growth extended from the frontal sinus anteriorly to the sella turcica posteriorly, overlapping the latter several millimeters. There was some pus coming from the frontal into the nose on that side. The author thinks it remarkable that so large a tumor should not have caused more symptoms, but the only complaint was the cosmetic deformity. M. B.

SOME OBSERVATIONS UPON TUMORS OF THE EYE.—RUMSEY, CHAS. L., Baltimore (*Jour. Ophth., Otol. and Laryn.*, March, 1917). Malignant growths of the eye are not only important in themselves, but also because of the light they are apt to throw on obscure parts of general pathology. A good prognosis can often be given to early diagnosis and enucleation. He reports five cases. His first case was one of glioma in a child of four. Eucleation. No recurrence. The glioma in this case began in the inner layers of the retina and grew inward, a condition he speaks of as glioma endophytum. The reverse order he calls exophytum. His second case was one of sarcoma of the chorioid in a woman of forty-five. Enucleation, no recurrence. It is said that tumors with hemogenous pigmentation appear to be less malignant. This tumor was of that type. The doctrine of Hirschberg that chorioidal sarcoma may be considered cured when patients remain healthy four years after enucleation is not always true as evidenced by contrary reports. Transillumination by the lamp of Würdemann for the anterior portion of the eye, and the diaphanoscope of Hertzels for the posterior portion of the eye are valuable for diagnostic purposes. Case 3 was a man of 34 who was thrown over a horse's head and upon arising found he could not see with right eye. Two months later the author made a diagnosis of detachment of the retina. The eye showed pericorneal injection, shallow anterior chamber, tension +1, pupil dilated and no fundus reflex. The other eye was 10 D myopic. The right eye was enucleated and found to contain at the posterior pole a round and spindle cell sarcoma. The case was lost track of after he left the hospital. Case 4 was a man of 55 with a black growth 10×6 mm. covering the left third of the cornea and part of the sclera which was firmly attached. The growth was removed for study and was found to be an epithelioma and not a melanotic sarcoma as suspected. The eyeball was enucleated the next day. No recurrence. Case 5 was a man of sixty-seven who had had some surgical work done for a tumor of the left lower lid. The lid was ulcerated, extending from the middle lower border, involving the lachrymal sac and approach-

ing the upper lid. He enucleated the eyeball, eyelid and lachrymal sac, making a lower lid after Ammon and Lagenbeck's method, and an upper lid after Fisch's method uniting the lids. Four and a half years later the patient returned with an ulcer of the upper lid of his other eye which followed a scratch of the skin. Radium treatment was used by Dr. Kelley resulting in a cure. Microphotographic reproductions are shown. M. B.

VISUAL FIELD

VISUAL FIELDS IN PELLAGRA.—CALHOUN, F. PHINIZY, Atlanta, Ga. (*Ophth. Record*, Feb., 1917). The author can positively state from investigation: That in most cases of pellagra there is a contraction of the field of vision for form and color, with frequently an interlacing or misplacement of colors, especially the green and red; and that in a relatively large proportion of the cases there is a scotoma for red and green and occasionally for all colors. These scotomatous areas do not necessarily occur in the typical or acute cases for in two patients we were able to detect these changes before a diagnosis of pellagra had been made. G. I. H.

THE BLIND SPOT (Second communication).—GRADLE, HARRY S., Chicago (*Ann. Ophthal.*, Oct., 1916). This paper is limited to the discussion of the normal blind spot for black and white. He first deals with the observations of Marriotte, Le Cat, Hannover and Thomsen, Donders, Helmholtz, Listing and Coccius. The use of the tangent screen was first proposed by Bjerrum and this method is now accepted as the most accurate for the determination of the size of the blind spot. The author described an instrument in his first communication which he has now modified to render it more practical for routine clinical use. It consists of a table one meter long, on one end an adjustable chin rest; thirty centimeters from this, an upright black rod, two millimeters in diameter, with a slightly rounded top, the rod being moved laterally across the table in a groove and being extensible vertically; sixty centimeters from this chin rest a dull-white, round celluloid screen, fifty centimeters in diameter—this is clamped against a ring composed of wound wire connected with the lighting circuit, forming a solenoid; attached to both sides of the bottom of the solenoid are jointed arms bearing steel pencils, one centimeter thick and three centimeters long, the tip resting against the posterior surface of the screen; the posterior surface of the screen is marked by cross lines, one centimeter apart, the vertical ones being lettered; at the patient's

end of the table is a push button connected with a small electric lamp located behind and below the screen. The patient is seated on a low stool with his chin on the rest. The intermediary fixation mark is moved so the patient gazes across it right near the periphery of the screen. One of the pencils on the end of the jointed arm is then moved so that a blue steel ball bearing, rolling over the anterior surface of the screen and held there by the magnetic force imparted to the pencil, comes into line with the patient's eye and the intermediary fixation mark. The ball bearing becomes a permanent fixation mark and remains in place. Another ball bearing of black, or whatever color is to be tested, is then put on the anterior surface of the screen and held there by another pencil. This is the testing mark by which the blind spot is outlined. As soon as this disappears from the patient's view, the examiner is signaled by the electric flash lamp. The position of the tip of the pencil controlling the testing mark is noted in terms of the numbered and lettered lines. After the examination the record is plotted out in 1/10 inch cross section paper. Should there be any reason for changing the position of the head the presence of the double fixation mark allows of an immediate and accurate reposition. Continued fixation causes tiring, therefore the necessity for rest occurs in long drawn out examinations. A composite blind spot, arranged from 13 uveal cases at 60 cm. distant shows the vertical diameter to be 8.393 cm. and the horizontal to be 5.55 cm. and the exact center lies 17.13 cm. from the point of fixation and one cm. below it. This test was made by moving the testing mark toward the blind spot area, which is the right way. M. B.

ABSTRACTS FROM JAPANESE LITERATURE

ABSTRACTS FROM THE NIPPON GANKAKAI ZASSHI

JULY-DECEMBER, 1916.

By PROF. DR. KOMOTO AND DR. H. S. GRADLE.

JULY

SUGANUMA AND HOSHIYAMA

Concerning vital training of the cornea and the genesis of spiculæ. By subconjunctival injections of a carmin solution, the authors were able to produce a vital staining of the rabbit's cornea. Either preceding or following the vital staining, the cornea was cauterized with a zinc solution; the ciliary arteries were severed; or croton oil injected into the vitreous with the formation of the following types of spiculæ:

(a) Spiculæ with eosinophilic granules (consisting of eosinophilic leucocytes that had forced their way in between the fibrillæ):

(b) Spiculæ with coarse carminophilic granules (consisting of Ranvier's klastocytes that had forced their way in between the fibrillæ);

(c) Spiculæ with delicate carminophilic granules (consisting of corneal bodies that had become mobile and forced their way in between the fibrillæ).

II. Regeneration Spiculæ:

(a) Spiculæ with delicate carminophilic granules (consisting mostly of corneal bodies which usually were in direct protoplasmic connection with the undamaged mother cell).

The authors did not mention anything decisive regarding the question whether or not there be so-called slumber cells within the cornea, which awake during an inflammatory process and take part in the formation of the spiculæ, but they inclined to doubt the truth of this theory.

KURLYAMA

Anatomical-pathological findings in a case of chronic peripheral groove keratitis.

There was observed in a 41-year-old patient who died of acute gangrene of the skin, an progressive peripheral ulcer of the cornea in both eyes. Anatomically the floor was covered by a layer of epithelium, while the underlying parenchyma was composed of round, mast, and plasma cells. A great deal of fat was manifest by Sudan III stain.

KITAMURA

An unusual case of syphilis of the eye, followed by enormous disturbances.

In a 17-year-old Chinaman in Manchuria, the author observed a syphilitic process that began at the tip of the nose and spread over the entire left half of the face, destroying both lids and the eye. It called to mind a similar case seen by Silex.

KAGOSHIMA

Amplitude of accommodation among young Japanese.

This was found to be about the same as among Europeans; for example, at 10 years=13.2D.; at 17 years=11.1D.; at 18 years=10.9D.; at 20 years=10.7D. The remarkable feature was that the amplitude of accommodation takes a sudden jump of 0.6-0.7D. in women between 15-16 years and in men between 16-17 years of age.

KUSAMA AND NAKAYAMA

Endogenous panophthalmitis caused by a mixed infection of pseudo-diphtheria bacillus and staphylococcus.

In a 22-year-old soldier, there appeared spontaneously in the right eye, accompanied by febrile manifestations, a suppuration, which, however, was for the greatest part absorbed. During this, blood spots could be seen in the retina below the disc. After a short time, the inflammation reappeared, accompanied by orbital suppuration. In the enucleated eye, a round-celled infiltration of the chorioid and vitreous was found in which could be shown staphylococci and pseudo-diphtheria bacilli.

OKAYAMA

An interesting case of fundus changes with retinal embolus. A retinal embolus appeared at the macula in the eye of a 6-year-old woman accompanied, or rather followed, by extensive pigmentary changes, which the author believed to be due to a serious separation at the fovea.

ODA

Trachomatous pannus and the vascular circulation.

AKATSUKA

Intra-venous injections of bichloride in syphilis of the eye. The author had the same results by this method as with salvarsan.

WATANABE

Concerning pulsating exophthalmos.

The case of a 19-year-old man with a spontaneous form of this disease. Improvement under digital compression led to ligation of the carotid with good results.

FUSITA

Concerning the dilator of the human iris.

With extremely delicate sections, the author was able to prove that the lower epithelial cells belong to the dilator system, a fact that has never been proven.

KESIMA

Lymphoma of the conjunctiva in connection with an unusual case of foreign body in the conjunctiva sac.

The author saw a Chinese farmer in Formosa with a sausage-like thickening of the conjunctiva of both eyes, composed entirely of

small lymphocytes. Furthermore, in the left eye was found a foreign body, which eventually proved to be a rice granule.

MATSUOKA

Trachomatous changes in the tear gland.

In the tear glands in trachoma may occasionally be found a plasma cell infiltration as well as follicle formation, while in xerosis, an atrophy is present. The author considers this latter fact as one of the essential conditions of the xerosis in combination with scar tissue.

KOMOTO

Lid plastic by the Italian method.

The author has employed this technique twice, both times with good results. In the last case there was a total ectropion following acid burn of the face.

ONISHI

The older forms of glasses used in Japan.

AUGUST

MASUDA

Additions to the pathological anatomy of the rodent ulcer of the cornea.

In this unusual type of ulcer, the author found the following: The base of the ulcer was covered with a 7-10 cell deep layer of epithelium that at the edges curved over so that the floor of the ulcer was denuded of epithelium. There was some lymphocytic and plasma cell infiltration under the thickened epithelium of the floor as well as some polynuclear leucocytes and eosinophiles. The central abrupt edge, where Bowmann's membrane and the epithelial layer were lacking, was likewise infiltrated, but especially at the apex of the curve where the peripheral portions joined the floor of the ulcer, was a dense cellular infiltration that could be followed deep into the corneal parenchyma. The rest of normal appearing cornea showed but slight cellular infiltration, and Decemet's membrane and the endothelium were intact. The author does not believe that this is an ectogenous process, but rather that it is due to endogenous bacillary toxæmia, causing the corneal destruction. In proof of this, he mentions the fact that both eyes are frequently attacked and that therapeutic measures aimed at local relief are without avail.

EBARA

Tumor-like miliary tuberculosis of the orbit.

In a 9-year-old girl there was found a right-sided exophthalmos with slight inflammation of the lower lid. During the enucleation the orbital tumor was found to be a tubercular inflammatory process, lying closely behind the eye. In all probability, the disease originated, not from the periosteum, but from the sheaths of the optic nerve.

OGUCHI

A hitherto unknown bacillus as the cause of panophthalmitis.

A panophthalmitis followed an adherent leucoma with the causative factor in the form of an unknown bacillus. The organisms were short, thick rods like colon bacilli, but without gas formation. They were Gram negative. They are encapsulated and have flagellae, thereby being actively mobile. An agar, they form gray round colonies that are moist and shining. Stab culture in gelatine causes liquefaction after two days. Injection into a mouse was followed by death within ten hours.

WAKISAKA

Investigations upon trachoma in a fishing village in relationship to family transmission.

The author examined all of the inhabitants of a fishing village that has been long known as the stamping ground of trachoma. He found that the disease was quantitatively and qualitatively worse among the women than among the men and that the family transmission was carried more by women.

SAKAGUCHI

The comparative characteristics of the Japanese conjunctival coccidia.

In the author's neighborhood, the conjunctival coccidia seem to be more widespread, so that conjunctival hyperæmia is frequently found among large groups of people. They have a small round form and consist of three layers; moreover, there is a nucleus and definite cycle of development. They can be best stained with eosin or the author's modification of the Romanowsky.

SUGANUMA

Pathological changes in the chorioidal membrane and the retinal pigment epithelium.

An extensive abstract will appear upon completion of the work.

KUMAGAI

Regarding the cause of the changes in the intra-ocular pressure and the albumin content of the aqueous under the influence of various collyria; further, a contribution to the question regarding the source of the aqueous.

Experiments with normal aqueous: The effect of eserine was found to be exactly as Wessely had claimed, but the author believes that the cause of the change lies in the miosis, as the effect is lacking after extirpation of the sphinctor iridis. Pilocarpine produces the same effect as eserine, but the effect here is due to the hyperæmia resulting from the action of the drug upon the intra-ocular vessels. Atrophine decreases the intra-ocular pressure, due, the author believes, to a decrease in the surface of the iris and a consequent decrease in the area of absorption. But the albumin content of the aqueous is not thereby influenced.

The author's work with adrenaline gave such divergent results that the work is not suitable for an abstract.

By means of the Pissem's methods, pilocarpine and, to a lesser extent, atropine, was found to dilate the peripheral vessels, whereas eserine had a contracting effect. The author leans toward Hamburger's views regarding the source of the aqueous.

KATAYAMA

Three cases of epithelioma of the lids.

All three were on the lower lid and two at the canthus.

SEPTEMBER

KOSIMA

Bilateral endothelioma of the lower lids.

Bilateral tumors were observed in the lower lids of a 41-year-old man. Death ensued from brain disease and the tumors were found to be endotheliomata.

SHIKANO

A dermoid of the lower palpebral conjunctiva.

A highly pigmented dermoid was seen in the exact center of the lower palpebral conjunctiva.

G. KOMOTO

Contribution to the knowledge of primary uveal tract sarcoma with notes on one hundred cases.

This extensive piece of work does not lend itself to abstract, but will appear in *extenso* in the British Journal of Ophthalmology.

J. KOMOTO AND HORI

A case of traumatic enophthalmos.

A typical case of traumatic enophthalmos upon which a Krönlein operation was performed. During the course of the operation, a thin, tough strand of connective tissue was found attached to the posterior scleral wall and the tension thereon caused the enophthalmos.

NAGANO

Pyoktanin therapy in dacry-cystitis.

Following the injection of pyoktanin into the sac, the author saw a prompt cessation of the purulent discharge.

SUGANUMA

Pathological changes in the chorioidal membrane and the retinal pigment epithelium.

A continuation from last month.

OGAWA

A clinical consideration of Keratitis Parenchymatosa observed over a period of three years.

The author saw 48 cases of keratitis parenchymatosa of varying ages. The peak of the disease was reached at 25 years of age and from then on, it fell off in frequency.

FUSITA

The relationship of the adrenals to the retina.

The author saw no retinal changes in cases of inflammation of the adrenals, in contradiction to Kumagai, who found, under such circumstances, a disturbance of the visual purple.

SHIOSI

Two cases of intra-dural tumor of the optic nerve.

Histologically, one case was a glioma, while the other was a myxomatous sarcoma.

UCHIDA

A case of so-called malignant glioma in the region of the "Zirbel" gland.

There was a bilateral papiloedema, somewhat relieved by a trepanation. At autopsy, there was found in the region of the "Zirbel" gland, a glioma in part calcified.

WATANABE

Green cornea following trauma.

The author mentioned several cases of reddish-green discoloration of the cornea, following trauma with intra-ocular hemorrhage and

believes that the discoloration is due to the presence of hemosiderin in the cornea, but that the purely green color appears only in the face of a cyclitis.

OCTOBER

SEO

A trachomatous new-growth of the conjunctiva (a form of plasmoma).

A child presented the conjunctiva of the lower lid thickened almost in the form of a tumor and accompanied by a thickening of the tarsus. Histologically, the new growth which caused the thickening, consisted of plasma and lymphoid cells and some follicle formation.

KUSAMA

Concerning the pathological anatomy of primary fatty degeneration of the cornea.

In this extremely rare form of corneal disease (first described by Takayasu of Japan, and then by Tertsch of Vienna), the author found a layer of fat in the corneal parenchyma and innumerable empty spaces in the anterior epithelial layer, lying just anterior to Bowman's membrane and frequently involving that structure.

MORI

Concerning arcus juvenilis.

Clinical description of the location and form of the various types.

WATANABE

Statistics concerning trachoma in the isolated village of Tokushiwburaki, in the province of Yamaguchi.

WAKISAKA

Family trachoma. Continued from August.

MURATA

Three cases of congenital anomalies of the iris.

OKAYAMA

Primary fatty degeneration of the cornea with intermittent inflammation.

A fatty degeneration of the cornea was observed in an old woman, complicated with intermittent appearances of inflammation, due to multiple minute erosions of the cornea over the area of degeneration. These became visible with pyoktanin staining.

NAKAMURA

A new optical delusion.

Dr. Mizuo was the first to call attention to the fact that two straight crossed lines appear to be interrupted at their point of intersection and appear to be bent in that neighborhood. For the appearance of this phenomenon the author was able to determine that the following factors were necessary: the necessary visual angle of the straight crossed lines was from 10-58 seconds; the greater the difference in luminosity between the lines and the background, the clearer was the phenomenon; the illusion did not appear if both elements represented contrast colors, probably because of simultaneous contrast; the direction of the crossing lines is immaterial, but if the observer stands upright, the phenomenon is clearest when the lines are horizontal; the angle of crossing must vary from 5 to 45 degrees. The cause of the appearance of this phenomenon lies primarily in the contrast of convergence and divergence, as well as by the irradiation of the crossing lines through light aberration into the physiological eye. Ocular movements, although secondary, are of supporting value.

NOVEMBER

MASUDA

Statistics concerning myopia.

Various phases of myopia came under this examination, but probably the most remarkable fact is that 20% of the myopia was found to be hereditary. Among women, the macula changes appear earlier than among men and usually are of a more severe character. The vision, too, is poorer in spite of early and full correction. Under equal errors of refraction, the vision is apt to be less among women than among men. The author closed the paper with illustrations of various macular changes that he found.

SUGANUMA

The pathological changes in the chorioidal membrane and the retinal pigment epithelium. (A continuation).

G. KOMOTO

Contribution to the knowledge of primary uveal tract sarcoma with notes of one hundred cases. (Continued).

ODA

Fixation forces for holding the lid in an everted position.

One blade of the forceps consists of a broad slightly round plate

and the other blade of a smaller plate with minute teeth. The object is to hold the lid for excision of the tarus or retro-tarsal fold.

FUSITA AND TAKITA

An unusual type of exophthalmos among fresh-water fish.

The authors observed that the fish (Funa) in a certain brook in Formosa were all suffering from exophthalmos without any further abnormality being found. Anatomically, they found small air pockets in the orbit, which pressed the eye forward. As the waters of that brook seemed to contain some sort of gases, they experimented by introducing the fish into water heavily charged with carbon dioxide and observed that the fish developed an exophthalmos, identical with the one described. Probably, the carbon dioxide is absorbed by the blood and freed from then chorioidal glands into the orbit, where it forcibly shoves the eye forward. When the fish are returned to normal water, the exophthalmos gradually recedes.

NISHIMURA

Concerning the effects of acids and alkalies upon the eye.

This work is from the clinic of Prof. Siegrist in Bern. According to the results of the author, alkilies have a more energetic and deeper effect upon the eye than have acids so that the remote effect (iritis with hypopyon) is not infrequently seen from burning with caustic alkilies. The author worked principally with ammonia.

DECEMBER

WATANABE

Restoration of the conjunctival sac.

The author followed Weeks' technique for restoration of the conjunctival sac by skin transplant and obtained a good result.

WAKISAKA

Family trachoma in a fishing village. (Continued).

NAKAMURA

A new optical delusion. (Continued).

SHIOSI

The diagnosis of a posterior scleral tumor and the operative treatment.

The tumor proved to be a lympho-endothelioma arising from the posterior portion of the sclera and causing a kink in the optic nerve. It was removed by a Krönlein operation.

OWUCHI

Hereditary megalocornea.

Report of a family with numerous cases among its members.

MASUDA

Clinical examination of the so-called central retinitis.

This form of central retinitis, with its numerous recurrences, is very common in Japan. Although no fundus changes have ever been proven, still the vision decreases and the central scotoma becomes appreciable. But by careful examination with the Thorner, very minute changes in the central pigment epithelium, either with or without a light oedema of the macula, can be found. He further discusses the clinical symptoms, so characteristic of this disease.

MIKAMI

Extensive burn of the face by an electric current.

A 38,000 volt current caused an extensive burn of the entire face, resulting in complete bilateral ectropion. This was completely overcome by an extensive skin transplant (without pedicle).

Book Reviews

The Practitioner's Medical Dictionary.—Gould, George M., A. M., M. D. Contains all the words and phrases generally used in medicine and the allied sciences, with their proper pronunciation, derivation, and definition. Third edition, revised and enlarged, by R. J. E. Scott, M. A., B. C. L., M. D. Based on recent medical literature with many tables. P. Blakiston's Son & Co., Philadelphia. The price of this book is \$2.75.

We again welcome the appearance of a new edition of this very satisfactory, condensed yet exhaustive dictionary of medicine now issued in 962 pages on India paper with limp cover. It is recommended for the desk companion of all physicians as well as writers.

In its new form, it is believed that this well known dictionary will be even more useful than before.

H. V. WÜRDEMANN.

Eye, Ear, Nose and Throat, a Manual for Students and Practitioners.—Ballenger, Howard Charles, M. D., and A. G. Wipperrn, M. D. New second edition, thoroughly revised, illustrated with 180 engravings and 8 colored plates. Lea & Febiger, Philadelphia and New York, 1917. Price \$3.50.

This work is classed with the medium sized text books particularly useful for the general practitioner and the student. The Ophthalmic Section taking 180 pages, the Ear, Nose and Throat completes the 503 pages of the book. It is well illustrated and well printed and bound and is recommended for the student.

H. V. WÜRDEMANN.

Ophthalmic Lenses and Prisms.—Prentice, Charles F. An essay contributed to "The American Encyclopedia of Ophthalmology." Illustrated with 128 original diagrams and four plates from the pen of the author. Complimentary edition, limited to 200 reprints. Cleveland Press, Chicago, 1917.

This is a complimentary edition of the article in the American Encyclopedia of Ophthalmology and is a monograph on the subject well worth separate publication, as are many of the other lengthy articles of the encyclopedia. This is a presentation edition limited to 200 copies and sent by the author to his professional friends.

The illustrations are all original with a photograph of the author as a frontispiece.

Of particular moment to the practicing oculist are the descriptions of the newer form of lenses as the Torics, aspheric lenses and bifocal lenses.

H. V. WÜRDEMANN.

The Fundus Oculi of Birds, Especially as Viewed by the Ophthalmoscope.—Wood, Casey Albert. A Study in comparative anatomy and physiology. Illustrated by 145 drawings in the text; also by 61 colored paintings prepared for this work by Arthur W. Head, F. Z. S., London. The Lakeside Press, Chicago, 1917.

Although the author has been for years not only one of the foremost but as well a voluminous writer upon ophthalmic subjects, the editor and author of exhaustive treatises such as his work on Ophthalmic Therapeutics, Ophthalmic Operations and the American Encyclopedia of Ophthalmology, yet this monograph on the Fundus of Birds will probably be consulted many decades after he is gone and after his medical works have been relegated to the limbo of ancient literature or have been entirely forgotten.

This is a scientific work that the ornithologist of the future will consult with wonder at its exhaustiveness and if he only knew of the manifold duties of this busy practicing ophthalmologist and medical writer, he would marvel at the possibility of such a book being developed under the existing circumstances.

It is not only with the utmost pleasure that I have received, read and studied a good part of the work, but I have learned a great deal therefrom. I now know why the birds see better than human beings. I know why the eagle is able to look at the sun and I know why the owl sees in the dark.

The beautiful printing, binding and illustrations of the work makes it a monument to the energies of the author as well as a very valuable contribution to the anatomy and physiology of vision as shown in our winged friends.

H. V. WÜRDEMANN.

Oral Abscesses—Thoma, Kurt H., D. M. D., lecturer on Oral Histology and Pathology and member of the Research Department of Harvard University Dental School. Ritter & Co., Boston, 1916.

This is one of the most timely works of recent years. It is very freely illustrated, largely with Xray dental plates, the reproduction of which have lost but little from the originals and hence of the greatest value in the elucidation of the text.

Many of the illustrations are colored and nearly all are printed as inserts on calendered paper.

While the book is intended for the practicing dentist and mouth surgeon, it is of special interest to the physician and particularly so to the eye, ear, nose and throat surgeon, although this part of the subject is treated under the chapter of secondary complications in comparatively few words:—Treating of maxillary sinusitis, pharyngitis, trismus, conjunctivitis, keratitis, scleritis, iritis, cyclitis, choroiditis, retinitis, optic neuritis and glaucoma, otitis media, otalgia, etc.

General conditions are more thoroughly discussed and the fact that septic lesions in the mouth may be foci or primary causes of many acute or chronic diseases of systemic nature relationship between the oral cavity and the health of the patient and is well shown. The book is recommended not only for the library but for the desk of every specialist as well as every general physician.

H. V. WÜRDEMANN.

VALE.

During thirteen years OPTHALMOLOGY has served the purpose of furnishing a pabulum for ophthalmic minds: at times hard of digestion, being those papers replete with statistics containing masses of theories and facts, and at times, articles which may have served to sweeten the mind like desserts do the meal.

Some of our abstracts and reviews have certainly been nutritious, like the roast, others have been stimulating like the coffee or bitter wine, and still others may perhaps be likened to the corrective medicine that at times has been necessary after a banquet.

Be all this as it may, the Staff of OPTHALMOLOGY has endeavored to serve the Ophthalmologists of America to the best of its ability: all of us without monetary reward, taking our pay largely in the knowledge of a work that, to our minds, has been well done.

Thirteen years ago, a number of the members of the staff of OPTHALMOLOGY endeavored to secure an amalgamation of the various American Ophthalmic publications, but the times were not then ripe for the event. However, during the past year this has been consummated mostly through the indefatigable work of our friend and Fellow Editor, Dr. Edward Jackson, of Denver, Colorado.

"Through various channels the ophthalmologists of America have learned in the last few months of a proposal to merge some of the existing ophthalmic journals into one stronger, more valuable publication, that should avoid unnecessary duplication of material and keep its readers in touch with the Ophthalmic literature of the world. We are now glad to announce that these plans have so far developed as to make pretty certain the appearance of the new journal at the beginning of the next year. The subscriptions already received for such a journal offer an adequate financial support.

It is definitely decided that the following journals will be merged in the enterprise:

The Annals of Ophthalmology.

The Ophthalmic Record,

OPHTHALMOLOGY,

The Ophthalmic Year Book.

Ophthalmic Literature.

In addition, it is probable that one or two other ophthalmic journals will join in the enterprise.

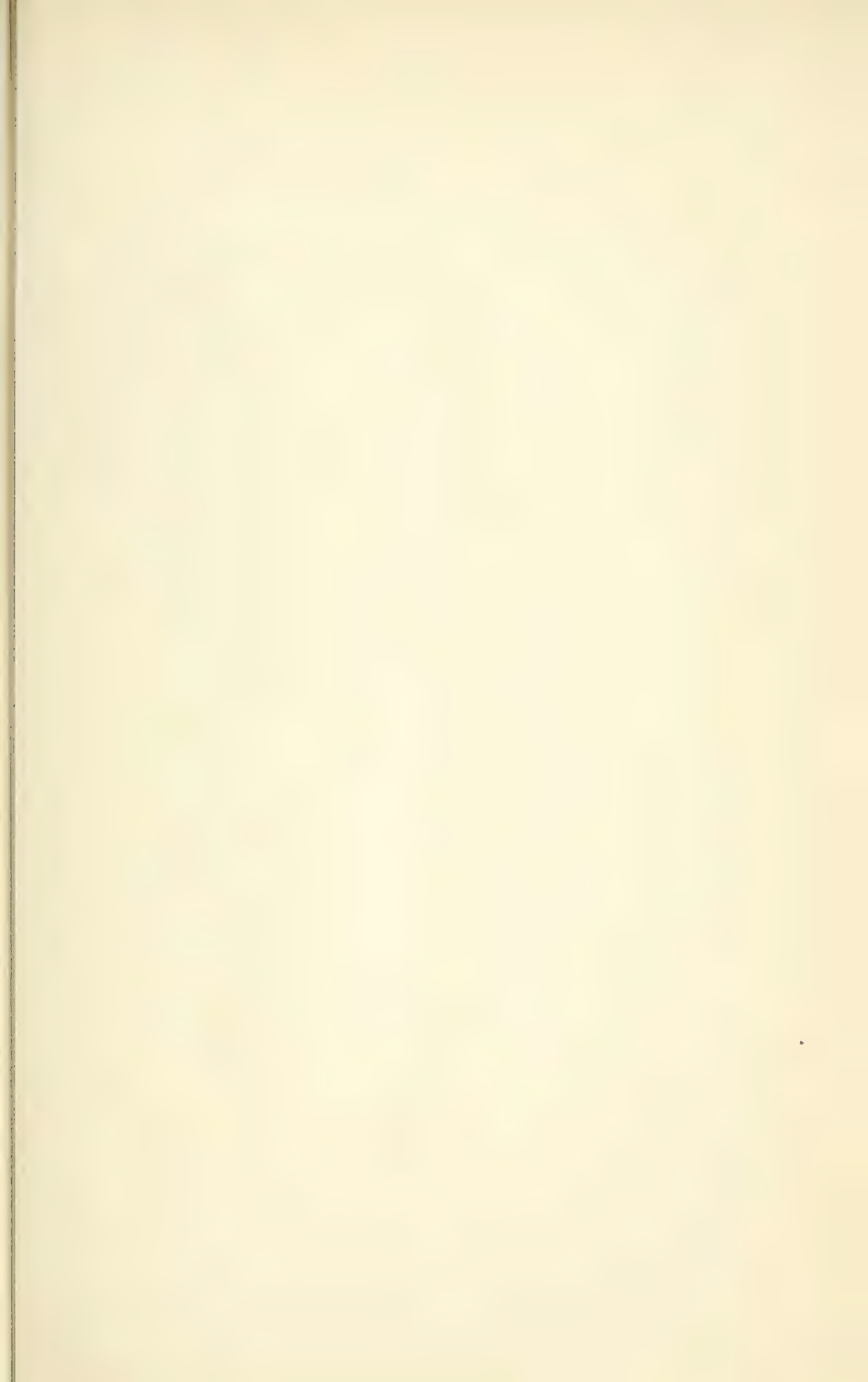
The editorial staffs of these publications, with the united support of the ophthalmologists of America, will be able to issue an ophthalmic journal that will compare favorably with any in the world, and one which may be expected to aid and keep pace with the development of ophthalmic science. A more detailed account of our plans will be laid before our readers in the issues of other journals."

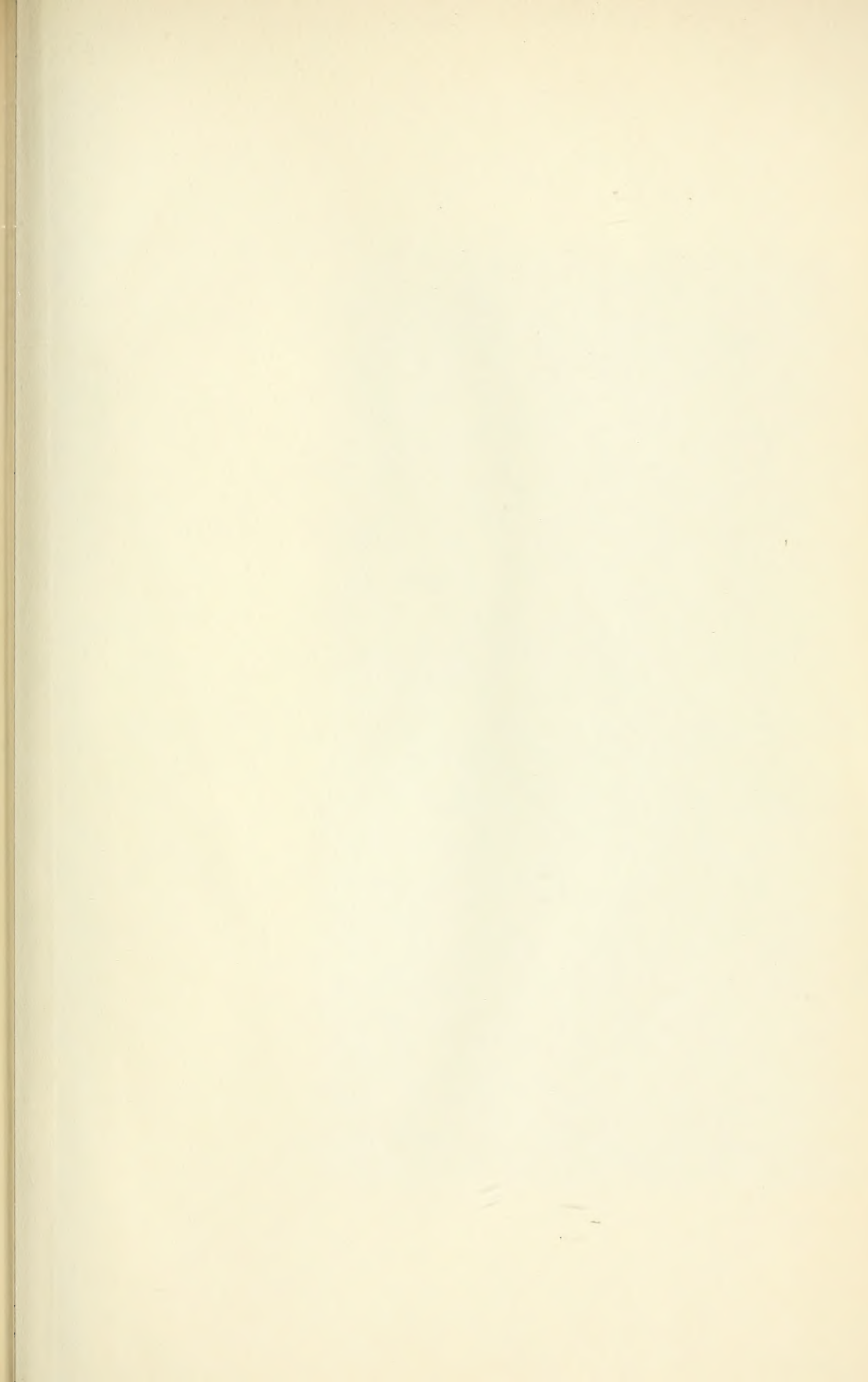
The working members of the staffs of the several merged journals will be included in the staff of the new publication.

As our journal year ends with the July issue and the new journal will begin with the first of the year, and as business relations have been consummated so that the subscription list of OPTHALMOLOGY will be continued onto that of the new journal, necessarily with the debits and credits of our publication, we close the publication offices of this journal with the July issue.

Thanking all our subscribers, the writers and especially the Associate Editors, OPTHALMOLOGY expresses to the Ophthalmic world its hearty co-operation and its assurance for the success of our new journal, which will be "owned, edited and published by and for the Profession."

BY THE EDITOR.





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